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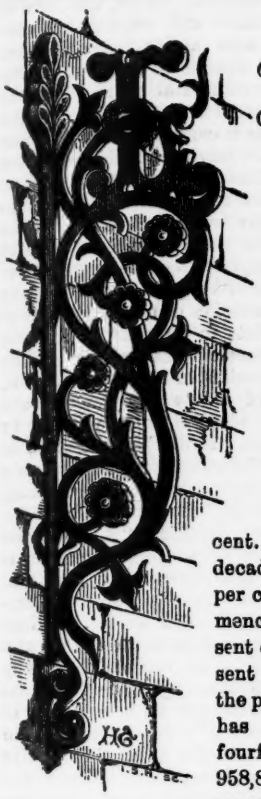


The New Census and the Growth of London.

LONDON has abated of its rate of increase during the past decade, as compared with that twenty years ago. It no longer doubles in forty years. The decennial increase has been 560,311, or about 17 per cent. on the enumeration for 1871, which was 3,254,260. In the decade 1861–71 the increase was 16 per cent. In the preceding decade it was nearly 19 per cent. From the commencement of the present century to the present time the increase of the population of London has been very nearly fourfold, rising from 958,863 in 1801 to the present total of 3,814,571. Thus the mean annual rate of increase during the present century has been as nearly as can be stated in round numbers 1¾ per cent. per annum, or 1,750 souls per 100,000 every year. The greatest rate of increase maintained in any decennial period was between 1851 and 1861, in which decade London increased in population by 23 per cent.

London, however, is no longer growing as a whole,—that is to say, in equal proportions in its several districts. This remark does not apply to the obvious difficulty of increase in the districts already fully crowded. On the contrary, there is evidence of continuous displacement of population within London itself. The City proper has declined in its population from 75,983 to 51,306, or by a little over 30 per cent. The once aristocratic neighbourhoods of St. George's Hanover-square, Marylebone, and Westminster have all declined in the number of their inhabitants. So have the busy thoroughfare neighbourhoods of Holborn and the Strand. So have the densely-peopled and poverty-stricken districts of St. Giles's, Shoreditch, Whitechapel, and St. George's-in-the-East. The total increase in the districts north of the Thames has been only about 12 per cent.,—that is to say, by the difference of 262,425, between 2,286,568 in 1871, and 2,548,993 in the present year.

On the south of the Thames, on the other hand, the decennial increase has been at the great rate of nearly 31 per cent., or from 967,692 in 1871 to 1,265,578 in 1881. The greatest increase here has been in the Wandsworth and Camberwell districts, being at the rate of 60 per cent. in the former, and of 67 per cent. in the latter. The only district north of the Thames which has rivalled this growth is Fulham, in which the increase has been at the rate of 72 per cent. in the decade. But percentages of increase do not in themselves tell the whole tale. In Wandsworth the increase has been from a density of 10 to one of 18 souls per acre. In Camberwell it has been from 26 to 43. In the Strand district, in which the reduction of density has been about 20 per cent., the density is still as much as 79 souls per acre. In St. Giles's, the densest of all the districts of London, the population in 1869 was 220 to the acre; in 1871 it was 218. It is now 184 souls to the acre. Whitechapel has now a density of 178, reduced from 194 in 1869. Shoreditch has only fallen from a density of 200 to that of 196 souls per acre. Westminster, in spite of its open areas, still crowds 40 inhabitants to the acre. St. George's, Hanover-square, holds nearly 130 residents per acre.

It would be a difficult task to account for the principle on which these averages have occurred, but it is one that it is highly important for the welfare of the metropolis to attempt. Cheapness of site, elevation above the river, and ready access to the centres of trade, are probably the predisposing causes which tend to increase the density of those districts which most attract the lower middle-class population. Brixton has increased from 35,435 to 62,817. Norwood from 12,536 to 19,017. But the river has its own attractions. Battersea has nearly doubled its population in the last decade, having risen from 54,016 to 107,248. But Streatham has more than doubled, rising from 12,148 to 25,545. It may perhaps be regarded as the case that, as each fresh district is attacked by the builder, and supplied with more easy means of access, the tide of influx will rise to a level first determined by the cost of site, until it is arrested by the very density thus caused.

The free opening of the river bridges is of too recent a date to have appreciably affected this displacement of population; appreciably, that is to say, as far as statistical data are attainable. In the next decade it is probable that this influence will tell. From the topography of London, marked as it is by the great angle that the course of the river makes to the west of Waterloo Bridge, it may be seen how central a position is occupied by Brixton, and, as a more lofty and airy suburb, by Streatham. Again, Fulham, and even Chelsea, though on the north bank of the Thames, only occupy that position in consequence of the southward bend of the river, and have more topographical affinity with Battersea, Lambeth, and Southwark, than with the district lying north of the Thames from Stepney to Charing-cross, and north of the chord of the curve from the latter place to Hammersmith. If we look at London as thus divided into north and south more fairly than by the sole boundary-line of the Thames, we shall find reason to expect that the growth of the southern portions is likely to be the most rapid and continuous, and that the district between the crests of the Kent and Surrey hills and the parallel of St. Paul's is likely to rival in density of population and rapidity of growth that which lies between the ancient site of the Temple of Diana, now occupied by the metropolitan cathedral, and the heights of Hampstead and of Highgate.

The total diminution, or displacement of population, from within the ten districts that we have mentioned, comes to nearly 75,000 souls. This, together with an annual increase of 56,000 persons, in round numbers, demanding a supply of, say 10,000 new houses for its accommodation, is a local depletion of 7,500 per annum, or a dilapidation or abandonment of some 1,500 houses. We must, however, remember, that of this depletion, that of 24,000 souls has taken place in the City. That is not to be regarded as a matter of abandonment of site, but, indeed, rather the contrary. The depletion of the City is due not only to the choice of suburban or of country residences by the City men, but also to the conversion into places of business, earning a high rent, of space which, if devoted to sleeping chambers, would earn a very low rent. In 1801 the City proper contained 156,849 residents, or more than 16 per cent. of the metropolitan population. The actual night population of 51,306 is not more than 1½ per cent. of the present metropolitan limit. But it would be palpably absurd to measure the value of the City property by its sleeping-room. To do so would lead to the estimate that the City is now worth only a third of its actual value in 1801. That its wealth has, to say the least of it, increased *pari passu* with the increase of the metropolis, can hardly be doubted. As it is, the City permanently houses 76 souls per acre, while the average density of the 77,997 acres of the London of the Registrar-General is only 48 souls per acre. The day census of the City will come in aid of this portion of the inquiry.

Among other things which have tended to the displacement of the centre of gravity within London, as before indicated, not the least effective has been the location of railways. In this we have, to a great extent, been at the mercy of hap-hazard. The opposition made by all the great cities and towns to railways in 1833–1835 has given a want of system to our metropolitan lines, from the ill-effects of which we shall, perhaps, never quite recover. The public convenience, wisely studied, has never yet been taken as the determining principle of railway legislation. We need not now refer to the purpose for which the disastrous speculation of the London, Chatham, and Dover railway was started. Its effect on the growth and development of London was the last thing that entered into the heads of its projectors. And yet there can be little doubt that very much of the difference between the 12 per cent. increase of the northern, and the 32 per cent. increase of the southern, districts of London, in the last decade, has been due to the accommodation afforded by this line and its connexions for local traffic. Nor do we

doubt that the absence of any trunk line running, say from Charing Cross to Euston Station, or from Westminster to Baker-street (as to the desirable nature of which we have before now expressed our opinion), when contrasted with the net of railways south of the Thames, has had much to do, if not with the displacement of population, at all events with the more rapid strides with which London south of the Thames has advanced during the past decade as compared with the growth of northern London.

But, when all is said, there remains the unexampled fact of the steady increase of London at the rate of more than 1,000 souls per week. How utterly incredible such a fact would have appeared had it been predicted in the time of Aristotle, who thought 50,000 citizens the normal size of a state!

The percentages of increase in the successive decades of the present century have been as follow:—

	Per cent. increase.
1801 to 1811	18
1811 to 1821	21
1821 to 1831	20
1831 to 1841	17·7
1841 to 1851	21
1851 to 1861	23
1861 to 1871	19
1871 to 1881	17

In 1865 it was estimated that the future density of the suburbs of London might reach 30,000 per square mile. The actual population in 1881 is at the rate of 31,266 per square mile over the 122 square miles which, in round numbers, the metropolitan districts occupy.

AMATEUR ARCHITECTURAL ÆSTHETICS.

THE serious considerations of non-professional writers in regard to architecture, its meaning and its principles, are never without interest, even if they should only lead us to the conclusion that the writers imperfectly understand the subject. We say advisedly the "serious" considerations; for we do not, of course, attach any importance or interest to the mere careless and thoughtless expressions, often entirely capricious, with which persons who have never studied the subject are wont to give voice to their likings or dislikings about architecture. But when any cultivated man, who is not a practical architect or a professed architectural critic, has given some serious thought to what seems to him the correct view of the subject, there is, at all events, an interest in comparing this view with that of more specially educated architectural critics, and noticing how the subject appears to outsiders, and whether their way of looking at it suggests any new lights, and if we should be disappointed in this respect, we may have learned instead something about the difficulties in the way of understanding architecture among the lay brethren.

We have before us two rather definite attempts to express something in regard to principles of architectural beauty by amateur critics. One of these is included in a treatise on "The Science of Beauty," by Mr. A. W. Holmes-Forbes, in the course of which architecture is dealt with; and the other in a critical essay on "Principles of Architectural Beauty," by the Rev. J. M. Capes, which is prefixed as a preface to an illustrated work on the old and new churches of London by Mr. A. Capes. We noticed this publication briefly, in regard more especially to its illustrative element, a little while since, and hinted at the time that the reverend coadjutor's preface might on another occasion furnish us with matter for comment.

Here are two gentlemen, one a barrister and the other a clergyman, evidently men of culture and thought, who offer us their explanations as to what constitutes the philosophical basis of good design in architecture, and what are the causes or constituent elements of bad design. Let us see what they make of it. We will take the barrister first, as his is the most important and serious publication, although architectural considerations do not occupy a very large proportion of it. Referring first to his book as a whole, we may say that he takes a very full survey of his subject from his point of view, and that we agree with many of his conclusions and like a good deal of his writing very much. If we do not take the trouble to review his book in detail, it is not because it is not a good specimen of treatises of its class, but because we have an absolute scepticism, increasing with experience, as to there being any such thing as a *science* of the beautiful, in any sense in which the word science can be correctly used. Analysis of beauty or ugliness in design is possible to a great extent. It is possible to show pretty conclusively, or at any rate plausibly, what are the faults which make a design appear distasteful to us, and how they might have been avoided, and it is possible in a lesser degree to analyse the causes of satisfaction in designs which strike us as beautiful; but these, just as often as not, we shall find elude us, when we endeavour to reduce them to definite statements, and these processes of analysis, it must be observed, are "accessory after the fact" only. The application of such criticism for a life-time, and on the most correct methods, will not in itself enable any one to produce a design which shall be accepted as beautiful, and therefore it cannot be said that there is any science of beauty. Science is essentially what is demonstrable by argument and by evidence, and beauty is not and never will be so demonstrable. However many facts we may be able to collect which seem to support our theory, and however wide the generalisations we make, we are certain before long to come on facts which will not bend to it; on things which we feel to be beautiful, and which, according to our "science" ought not to be so. And if this is the case in regard to mere analysis, how much more formidably so in regard to creation. Make as many laws and theories of the beautiful as we please, we must always, if we are honest, confess in the end the truth of Bacon's simple but comprehensive reflection,—"Not but that I think a painter may make a more beautiful face than was ever seen, but he must do it by a kind of inspiration, and not by rule." As far as a so-called science of beauty is concerned in formative effort, that is the tacit confession it always has to make in the end. Theories for the production of what is beautiful are, in fact, the refuge of people who have no power of origination or expression.

What criticism of this kind can pretty certainly lay down is in regard to the conditions under which designs should be carried out, so as to make the best use of the material, and so as to express its relation to its surroundings in a logical manner. But this only applies to the secondary class of design, which is recognised as relative in its interest, so as to be regarded in its relation to something else, and not for its own sake alone. It is in respect to this class of beauty that Mr. Holmes-Forbes's definitions, or some of them, come in as, to a certain extent, true, though not very new: as that "beauty attaches only to utility," that "ugliness attaches only to inutility" (we might say, "or to utility not understood"). As comments on these he gives the laws that "the appearance of beauty varies inversely with the appearance of utility," and that, on the other hand, "ugliness varies directly with suggested inutility." Even in this general statement, however, we seem to stumble over contradictions. Put them in plainer language. "A thing cannot be beautiful unless it is useful, and yet the more useful it is the less beautiful it looks." That seems only to be another and more colloquial way of putting the same statement; and it is still more puzzling when we find that ugliness increases with inutility. But let us see how these ideas apply, in the author's view, to architecture.

In looking at the remarks preparatory to the question of architectural ornament, we see at once where the author's fallacy is. He has used the word "utility" in a double sense, though not intentionally. It is what logicians call the fallacy of an "ambigious middle term." He takes flowers as an example; they are admittedly beautiful; what is their utility? "Is it anything more than colour, shape, and motion? Assuredly it is. Their utility is made up of a structural organism and a physiological system containing a mine of wonderful instruction and constituting a science in itself." Unquestionably; but is that why so many ignorant people love the sight of them? or even so many people who are not ignorant? We must feel that it is not, and we must see, if we think of it, that even if that were a reason, that is not "utility" in the same sense that we speak of the utility of a capital or of a buttress. Utility in that sense (in which the author employs it further on) is the application of an object to fulfil some immediate practical purpose. If the flowers were placed in the room from an idea that the odours and emanations from them had a sanitary effect in purifying the air of the room, then the utility argument might be applied to them. But to say that they are beautiful structures from which we may, if we choose, learn a great deal, is not to prove their utility in the same sense of the term; and our own common sense tells us that it is not for that that we admire them. What makes the flowers beautiful, besides their colour (which might in a very partial sense be said to be beautiful in itself) is their expression. They may be of no earthly use to us, but they express beautiful design following a law: and that is a necessary element in beauty, and the force of this is rendered apparent by the author's own illustrations of it from architecture. He says,—"Were there such a thing as beauty independent of utility, Corinthian columns and capitals would be beautiful not merely in their accustomed places, supporting an entablature, but in places where they could serve no purpose whatever,—at the corners of streets, in markets, &c." Now, the *form* of the Corinthian column and capital has next to nothing to do with utility. A cylindrical shaft with a square abacus to take the bearing of the architrave would fulfil every demand of utility. Utility prefers the cylindrical to the square form, because it carries the weight, practically, as well, while leaving a little more space for light and for passage. But utility goes no further than that in the matter. The flutings are not useful in any way whatever; from the utility point of view they are sheer waste of labour. They are *expression*,—the expression of verticality. The carved capital is no use in the world; it is the expression of the importance of that detail, and assists in harmoniously joining the lines of column and abacus by its spreading form; and its expression, in its foliated details, is the expression of a law of symmetry and growth in nature, adapted to a purpose by art. But this is not "utility" in the sense in which we speak of the utility of a buttress as a means of support. In speaking of the meaning of some Gothic details, our author is at sea again in the same direction. "A boss must seem to tie the ribs of a groined roof, as it were; . . . a finial must grow like a tuft or shoot from the end or apex of some architectural twig or stem which does work. . . . None of these ornaments must be scattered about a building capriciously or at random, for it is by their position more than by their form that they serve to impress us with a notion of utility." Not a shred of utility is there in the finial, except in the case of a heavy finial to give more weight to a buttress,—a practical use of the finial which, from another passage, we perceive the writer is not aware of. And, as to the boss, it does not pretend to tie the ribs in a knot at all; it has a utility of the kind, which the author, from want of acquaintance with practical details of building, does not perceive. The origin of the boss was to get over the difficulty of mitring the rib-mouldings when they met at various angles, and a block would have answered the purpose in a utilitarian point of view. The carving is to give some expression to a space which otherwise would have been an eyesore; it is not beautiful on account of its utility, it is only that the boss, being required for utilitarian reasons, it is also made ornamental.

It is due to the author to say that some further remarks in regard to the ornamental treatment of objects are more or less true and well put. A spiral "form is pretty in a corkscrew, a creeper, or a spring, because there its utility is palpable; in a crutch, a candle, or a fishing-rod it would be hideous, because there its inutility would be palpable." This is a principle, of course, very widely applicable; though even here it would, we opine, be more true to say that a truly described spiral is beautiful in itself, as all figures expressive of true mathematical and geometrical ratios are,—they are expressions of a natural law; but that it becomes objectionable in the objects named, not on account of mere inutility, but something more marked than that,—absolute and absurd unsuitability to the purposes of the object. In the fishing-rod, for instance, it would add weight without increasing length or strength or the appearance of strength. Some other remarks in another part of the book show, what we have often had occasion to notice, the danger of amateurs erecting theories about architecture without sufficient practical knowledge as to how buildings themselves are erected, *e.g.*, "The pointed arch is much more beautiful, but much less useful, than the round arch. . . . . This arch requires more

space, more buttress machinery,* and is capable of sustaining by itself less weight than the circular arch." Would the author "be surprised to hear" that the facts are exactly the reverse? And that the first introduction of the pointed arch into English architecture was manifestly on account of its better constructive stability? Theorisers should be sure of their facts before they put forth such fancies as these. As to the pointed arch being more beautiful than the round arch, we take that to be a statement which no one can possibly make *ex cathedrâ*. It is very much a matter of association, apart from structural requirements. Our own feeling would be that when there is a large margin of strength and mass in the materials, the round arch is a grander and more dignified form, in architecture on a large scale.

The essay on "Principles of Architectural Beauty," by Mr. Capes, is much more simple in its theoretical basis. The writer endeavours to solve the problem by the assumption that architectural beauty of proportion arises simply from "the repetition of some unit of length, which seizes upon the eye of the spectator, and fills his mind with a sense of harmony of which he is none the less conscious because he cannot explain precisely what it is that he feels." In spite of this latter conclusion, the author of the essay does attempt to "explain precisely," and to state in so many words that the best architectural effect depends on the division of a building into precisely equal heights. It seems hardly worth while to refute so bald a theory, against which a number of the finest and most universally admired buildings in the world enter a protest at once,—even among the buildings in that strict Renaissance school of academical composition which Mr. Capes seems to have regarded as especially successful in following out this law. In connexion with this it may be observed that Barry's design for the Reform Club was founded on the Farnese Palace, not on the Borghese, as the author states. He accuses Barry of having spoiled his model by reducing the upper story to a height inferior to those below it. The Reform Club is a somewhat cold and expressionless building, but the treatment of the windows of the least important story so as to mark it off from the principal stories is really a correct piece of architectural expression, and so far a merit. The author complains that all over England, from gentlemen's mansions to London street-houses, the air of paltriness and shabbiness which characterises the upper stories is a fruitful source of the failure of modern architecture to command admiration. The simple fact is that in house-architecture the upper story is almost as a matter of course devoted to purposes of less dignity and show than the lower stories in the internal economy of the architecture, and the fact that the architectural design externally usually expresses this is just so much in its favour as a logical architectural expression. In another paragraph Mr. Capes urges that much of the superior beauty of Mediæval towers arises from the prominent importance and larger size given to their upper stories. Mr. Street, in a recent lecture, dwelt on the same point in speaking of the Campanile at Florence. But if so, what becomes of Mr. Capes's "equal unit" theory? In one or two passages he hits upon truths in architectural criticism, as in regard to the bad effect of colossal painting or sculpture on the scale of buildings. But taken as a whole, his essay, regarded as an attempt to furnish a basis for judging of architectural propriety of design, is only an illogical statement of a crude theory, utterly incommensurate with the facts.

These two specimens of amateur architectural criticism, both written quite seriously, and with an evident intention, on the part of men generally well educated, to apply their thought to the subject, serve to indicate the danger of theorising on architecture with deficiency of practical knowledge of it, and to give some measure of the very vague ideas which non-professional critics still have on the subject. Architecture, or the art of building with expression, is in fact an art far too various in its conditions and problems to be reduced within the compass of any hard-and-fast rule arbitrarily framed to secure the production of architectural beauty. If architectural beauty and expressiveness could be produced by adherence to such a law, architecture would be a far less interesting subject than it fortunately is.

* The author, noticing that large buttresses and pointed arches go together, jumps at the conclusion that the one necessitates the other. The fact, of course, is that the necessity for large buttresses in the fully developed Mediæval style arises from the effort to minimise the walling, and leave as large interspaces as possible; it has nothing to do with the fact of the arches being pointed.

DATES OF THE PYRAMIDS.

SIR,—It is much to be regretted when persons who may, in their own departments of art or of science, be deserving of all respect, volunteer to instruct the public on other subjects with regard to which the actual scientific knowledge attained is evidently unknown to them. I refer particularly to a remark made in your 1,996th number (p. 588, *ante*) as to the "probabilities" of the date of the erection of the Great Pyramid. This is assigned by one writer to the date B.C. 2170, on the ground that the Pleiades were then exactly pointed at by the entrance of the Great Pyramid. Assuming, on the authority of an astronomer, that such was the case, no record, allusion, or other historic reason, is known to exist to connect such a fact with the date of the building. It is a purely gratuitous assumption, which would have as much, or rather as little, value if applied to any other celestial body.

Again, such a statement as "Ham was a son of Noah, and witnessed the Deluge, 2348 B.C." is equally arbitrary. The profoundest students of the Pentateuch will be found to be the least positive, as to either the dates or the real meaning of these early chapters of the book of Genesis. The date 2348 B.C. is not within a couple of centuries of the latest determination of the time indicated by the book of Genesis for the Flood; while the real meaning of the whole passage is considered by many competent persons to be mystical or allegorical,—an opinion which has been greatly supported by the discovery of an Assyrian account of a deluge, agreeing in many points with the Mosaic account, but written from a polytheistic standpoint, and unquestionably mythical, and probably conveying astrological information. Thus, even if we suppose Ham to have been an individual, our speculations as to what he may have beheld have no chronological weight.

On the other hand, we have direct evidence as to Egyptian chronology from entirely distinct sources; and the coincidence between the dates thus obtained amounts, in many cases, to demonstration. The famous Turin papyrus, which gives an abstract of a list of dynasties, and which, as far as it is perfect, has thrown so much light on the account of the dynasties given by Manetho, is unfortunately wanting in many parts. Its accuracy has been confirmed by the sculptured tablet of Abydos, and by numerous monumental inscriptions, as well as by the Apis Stele, discovered by the lamented M. Mariette. As far back as the eighth century B.C., Egyptian chronology is accurately known. As to the earlier portions of the retrospect, going back to the date of the founding of Memphis by Menes, about 4455 B.C., there are some *lacunæ* which allow of possible questions of one or two centuries. But there are astronomical data, connected with the revolution of the Egyptian sacred year of 365 days without intercales. Then we have the mention of eclipses or new moons on certain days of the year in the reigns of certain kings. And again, the coincidence of the sacred year with the festival of Sirius, or the dog-star, are points which enable the student to cast anchor, in distinct periods, within a very few years. Among these periods may be named the reign of Rameses Mi Amoun, 1355 B.C., that of Thothmes III., 1604 B.C., and that of the erection of certain tombs and temples by the monarchs of the twelfth dynasty, 2857 B.C. The Labyrinth, and the formation of Lake Mœris are attributed to this dynasty; but the two greatest pyramids were built by monarchs of the fourth dynasty, 700 years before the tombs at Beni Hassan. The great interest of the pyramids which it is now proposed to explore lies in the fact that they contain the cartouches, and are likely absolutely to verify the dates, of the kings of the six earlier dynasties, reaching back, as before said, to about B.C. 4455.

The comparatively slight difference that can be detected in the forms of hieroglyphics, and in the canons and practices of Egyptian art, during the period covered by the succession of thirty-three dynasties of kings, but few of whom were contemporaneous, is a strong argument in favour of the opinion that Egyptian civilisation was very far advanced at the time of the founding of Memphis. The hydrography of the delta of the Nile, illustrated by the careful measurements made by Mr. Fowler of the deposits of the river in its flood, tells the same story. Little by little, but with absolute precision, the past history of Egypt, of Assyria, of Babylon, of the Hittite kings (whose ancient capital, Kadesh, on the Orontes, has during the past month been discovered by Lieutenant Conder), is being recovered. Only the other day was gained the invaluable cylinder containing a journal of the capture of Babylon by Cyrus. Very much that has been accepted on insufficient, or misunderstood, grounds, is in the course of elucidation, and the time for discovering imaginary "migrations from the plain of Shinar," within 4,000 years of the present era, is altogether gone by.

A. B.

N.B.—The preceding lines were written before the receipt of your article on the newly-opened pyramids (p. 591, *ante*), with the writer of which I am happy to find myself in accord. The date that he gives for Pepi is some century or so earlier than is contemplated by the figures I have cited. But this is quite within the limit of verification which I have indicated. "Five centuries" in your article is, of course, a misprint for fifty centuries. Let me, as an old student of Egyptian chronology, ask your contributor for any points bearing on definite dates that have been recovered in any of the recent explorations. You are probably aware that a paper has been read before the Royal Antiquarian Society giving reasons, on astronomical grounds, for the conclusion that the Egyptian calendar is as old as the year B.C. 23,941. It is, at all events, certain that there has not been, since that date, a coincidence of the three facts of the actual heliacal rising of Sirius, of the feast commemorating the event, and of the first day of the vague Egyptian year, on the 15th day of July.

THE DICTIONARY OF ARCHITECTURE.

THE "Dictionary of Architecture," which is slowly being produced by the Architectural Publication Society, has reached the volume "P—Q," which is now in the hands of subscribers. In saying that the work is proceeding slowly, we should do injustice to its compilers if we did not add that we believe it is at the same time "slow and sure," and that the rather too deliberate production of the work, of which some complaints have occasionally been made, arises in great measure from the conscientious effort to insure fulness and correctness. In the ordinary sense, indeed, the articles are often not at first sight as full as might be expected. They are characterised usually by brevity and concentration, and some of the subjects out of which much interesting reading might have been made, may seem to some readers rather dry and uninteresting in style. It may be replied, however, not without reason, that we have rather too much in the present day of literary-dictionary writing, and that the essential object of a dictionary is to furnish reliable information rather than light reading. A good many dictionaries of various descriptions which have been projected on the plan of furnishing elaborate essays on all the principal subjects, have afforded practical proof of the hazardous nature of such an enterprise, by the fact that they have never come to an end at all. And, apart from this, it is not an unreasonable reflection that contributors who spend so much time in extending their remarks in a literary form, are, perhaps not likely to have left themselves a proportionate amount of time for the less interesting and more laborious task of investigation. There is not much ultimate satisfaction in possessing a dictionary which is full of interesting reading in a piquant style, if at the same time we are haunted by doubts as to its accuracy as an authority for facts. The study of the Dictionary of Architecture affords sufficient internal evidence that the object aimed at is to afford reliable information, and to point out the best sources whence such information may be obtained in a fuller form when desired. It is evidently considered that a man who wished to study a subject fully in detail would not be content with going to a dictionary for it. The Dictionary of Architecture, therefore, aims evidently at giving those who refer to it the main facts which they may require at the moment, together with information as to the authorities which may be best consulted for the further elucidation of the subject. Thus some of the articles which are very brief in the wording consist, to a great extent, of a list of authorities and treatises on

the subject in hand. The value of a dictionary which gives this kind of information so very largely will be appreciated fully only by those who have had from time to time to hunt for books on a special subject, and who know by sad experience what valuable time is wasted first in the endeavour to discover what books on the subject are in existence, and then in laboriously going through one book after another only to find that five out of six of them are valueless for the purpose for which they have been consulted. Those who have occasion to study subjects connected with architecture may therefore feel grateful to a publication which is calculated to save so much of time and vexation by acting as a useful and, we believe, thoroughly reliable finger-post, and such students of the Dictionary of Architecture will find no difficulty in pardoning a want of literary interest or picturesqueness in its well-filled pages, if it gives them what is so much more to the purpose of a dictionary.

If we take as the first example the article on "Padova" (Padua), we find this a good specimen of the peculiar kind of usefulness at which the dictionary aims. There are no æsthetic disquisitions on the architectural monuments of Padua, and their qualities of design or of architectural merit,—persons who are seriously studying architecture are capable of doing their own æsthetics,—but the architectural student intending to visit Padua will find here a synopsis of all the main objects of architectural interest in the town; the dates, as far as known, of their construction, reconstruction, or restoration, notes of the special points of interest which are to be found in them, and references in the course of the article, and in a long list at the end, to somewhere about fifty publications, English, French, German, and Italian, in illustration of the subject, with, in many cases where the books are out of print, a note of the library or collection in which they are to be found. Thus the student is at once put in his way to learning all about Padua if he has a reason for doing the subject thoroughly; and if he only wants the main facts, the Dictionary article supplies them at sight. A similar style of article is given on "Palermo," appended to which is a schedule of the principal churches, with a brief list of the objects of interest in each. Under more immediately practical subjects we notice a very good article on "Painting-room," though we may say that most readers who required the information and the hints given in this article would have been more likely to look for them under the heading "Studio," which is certainly the term in general use, though not a strictly English word. Occasionally the articles seem a little too brief, and too much confined to giving direction where to look for information. Under the head "Perspective," we get merely a definition of the word, as "the art of representing solid bodies by means of pictures drawn upon a surface so as from a certain position to affect the eye in the same manner as would the objects themselves"; and after the remark that the surface is usually, though not necessarily, flat, we pass at once to a long list of books and authorities. Now we should think that a man referring to a dictionary of architecture for "Perspective" might reasonably expect to find some brief sketch of the principle on which the optical illusion of perspective was to be produced, as well as a mere definition of the word, which is, in fact, nearly superfluous. If the Dictionary assumed merely to give definitions, it would be another thing, but when we find under the heading "peach-house," a description occupying nearly a column, and with almost the minuteness of a specification, we certainly see no reason why "perspective" should be dismissed so cavalierly. Those who consult dictionaries often, however, will be quite aware that nothing is more rare than to find a dictionary composed throughout on a uniform plan and scale in regard to the nature and extent of the elucidation of its subjects. Under the heading "Picturesque," again, we might have expected to find a brief statement as to what qualities constituted the picturesque in architecture, instead of merely a statement that many writers had recommended picturesqueness in architecture, and that Professor Cockerell had contradicted them. Any one turning to the term "picturesque" in the Dictionary would certainly expect to find a definition of its meaning. In all practical subjects, however, the articles are as full and complete as the proportions of the Dictionary will admit, and in this it deserves especial praise. We hope its completion will be reached before very long. An effort should be made to effect this.

THE NEW BURSARY.

SIR,—Will you allow me room for a few words, independent of any personal considerations, on the subject of the noble offer announced on page 662 of the *Builder*, and with the aim of "handing on the torch to worthy successors"? It seems to me that, worthy as is the conception as to the founding of this special architectural Bursary, it is yet more deserving of imitation as bearing on the great question of the day,—the substitution of a practical and useful education for an education of cram. That the latter is tending rapidly to take us back to barbarism I fully believe, and, speaking as I do from the experience of younger men who have *not* failed at Woolwich and at Oxford, I have at all events before me the materials for forming a sound and unwarped judgment.

Nothing has struck me more, in residence for many years on the Continent, and in experience gained in France, Portugal, and Italy, than the contented blindness in which we are apt to rest as to those portions of foreign practice which are in advance of our own. I am not now speaking of that instinctive love of art,—I had almost said that instinctive artistic taste,—which is inspired by the very air of Italy, when one breathes it less briefly than in a tour. No doubt a great deal has been done, and is doing, to bring before the student in this country such a knowledge of Italian art as can be attained, away from the magical influence of scenery, of association, and of climate. But what I more especially refer to is, that the Italian, a born and hereditary builder, differs from an English builder almost as much as a mason bee differs from a wasp. The instinct of the men who built, not for years but for centuries, is as strong in the Italian of to-day as it was at the time of the erection of Pompeii. Apart from decorative art,—of which the love may be far more prevalent than the educated taste,—the workmanlike habits of the Italian builder deserve the most careful study. The analogy of the two building insects is more close than might at first appear. With us, our pedigree as builders is of mingled origin. Our cities and towns have been evolved out of the wattled huts and swamp-surrounded dwellings of the Britons in the time of Cæsar; out of the framed houses that, perhaps, originated in the dragging ashore of the ocean home of a Viking, his sea plundering over, and his new abode gained by his sword; and out of the habits impressed on a mixed population by four centuries of Roman rule, involving in all probability, in certain districts, a strong infusion of Roman blood. But with none of these has lingered the native art of the Roman builder. I may refer more especially to his mode of preparation of lime for mortar. The English lime of the time of the Roman occupation was treated in the Italian method,—the method used in Italy at the present day. And therefore the mortar of our old Roman structures,—as at Guildford,—is as durable as are the flat tiles (also the present Roman form) which it binds together. The mortar of the days of Queen Helena, or of Agrippa, where it is now to be found in England, is much more likely to endure for a century or two more than the mortar mixed in the days of Queen Victoria.

I have spoken, sir, as to one point with which I have personal acquaintance, because it seems to me to illustrate the great use of such an institution as that in question. As to "modern planning," to the best of my own knowledge of Italy, it is always the most successful when it is more faithfully laid out on ancient lines. As to "water-supply, ventilation, and other sanitary arrangements," they are, according to my knowledge of Italy and the South of France, chiefly conspicuous by their absence. I should except, however, the admirable arrangement by which the masses of water that are precipitated by an Alpine thunder-shower on the streets and houses of Turin are conveyed, as if by magic, into the Po, leaving the little city as bright as a newly-fledged swan,—I do not mean a cygnet, but a bird in pride and purity of plumage. But my acquaintance with Italy is now old. Much may have been done in these last few years, in these respects, of which I am ignorant. The very admirable study, of which a notice was given in your columns, of the acoustic requirements of a music-theatre, is a proof that the modern Italian architects are not unworthily inheriting the names of the builders of the Colosseum, &c. And if a man, not unfamiliar with Italy, and who keeps up the study of Italian periodicals, thus feels himself left in the dark as to what is actually going on in that country in architecture, can there be a doubt of what a rich harvest awaits the future student, endowed for research by the Bursary?

It would be impossible more directly to confute such unscrupulous, and I may say unlettered, attacks on the noble profession of the architect as have appeared within the past few years,—to the astonishment of educated men,—in the *Quarterly* and in the *British Quarterly* reviews,—articles in which the bearer of the hod is styled the true builder, and the student of the art and of the science of architecture is treated only as a sort of vampire who preys upon the hodman,—than by the establishment of scholarships such as these. For it is to be hoped that the Godwin Bursary will only be the *primus* among *pares*,—many and good *pares*. To carry out the design it would, for many and grave reasons, be far better to have three associated students travelling together than one alone, or than three or four independent students. Many things would be open to the associated students that would be more difficult of access to a single explorer. There are parts of Italy, known to me, in which you enter at once into the Middle Ages. Such is the little city of Bitonto, in which every householder,—it was, at all events, literally the case some years back,—is a noble; every house a palace, and, if a small palace, a gem. A single student would have small chance of entering such a place as this,—rich as it is in architectural wealth. Three would appear as a "deputation,"—a magic word, that opens many doors. They would be worth the notice of the Syndic,—might attract the hospitality of some English-loving noble,—they used not to be rare in Italy. They would supply to one another company, counsel, emulation, mutual support and protection. It seems to me that the most worthy acknowledgment that can be made by architects and their patrons of the recent gift will be to treble its amount, and thus to attach to the first holders of the Bursary something of that associated status which used to prevail in the palmy days of Mediæval art.

As to the reality of the education thus to be obtained, I have now no room to speak, and there is so much that I would fain say. I have watched, with intense interest, the result of our educational campaign of the last nine years. I greatly fear that, mainly directed by amateurs, it has been woefully misguided. From all parts of the country, from every grade of society, comes the same chorus of complaint. Between the need of the England of the future, the production of the useful citizen, and the education of the day, it is hard to discover even an imaginary connexion. The military schools are an exception. In these men are definitely trained, whether in the best manner or not, for soldiers. Elsewhere, where can it be said that any man is definitely trained for anything? Send a son to the university, with a view to his entering the Church, and you will be recommended, at the end of his terms, to send him to a theological college, to be taught to preach! and other things. Can there be be a more trenchant satire on Oxford than the existence of Cuddesdon? Look at the examination papers,—for the Indian Civil Service,—for the Civil Service,—even for the Line? Could Clive, or Lord Wellesley, or the Duke of Wellington have passed? I very much doubt whether Dr. Thirlwall or Dr. Whewell,—ripe with the learning of a life,—could have passed "mods" at Oxford without a coach. No lad has a chance of passing a competitive examination without this costly aid, and when passed,—what is the good of the examination? It has put an unwholesome stress on the brain for a certain time. It has given to the student hardly a shred of utilisable knowledge, and it has given him a profound and, probably, an enduring distaste for any subject matter for which he was crammed, literary, scientific, or what not. It is the same in the lowest schools. Where is a lad trained to be a groom, a gardener, a domestic servant?—where is he taught even to address a superior with decent respect? Not at the Board Schools. Where are the domestic female servants to be found? If education consists in aiding the children of poverty to read the foul contents of the cheap "penny dreadfuls," we are a very wisely self-educating

people. But if education be something more than a conventionality on which coaches are to become millionnaires and schoolmasters to fatten, while the youth takes his own way, we are terribly out of our reckoning.

Such is the burden of general complaint. Is it overdone? I fear not. But against that system of solemn swindle and peculative cram, such a step as the establishment of a bursary for a working student is more than a protest. It is a step towards the utilisation of education. How much of the education of the day is merely useless, and how much actually mischievous, it is difficult to determine. As to the utility of really practical education, it ought not to be needful to speak. F. R. CONDER.

REVISION (ARCHITECTURALLY) REVISED.

CONSIDERING with what earnest interest the Revised Translation of the New Testament is now being scrutinised among all English-speaking communities, it may not be inappropriate for a contribution to be made to sincere and reverential criticism from a point of view which was, naturally enough, not specially occupied by any member of either the English or American companies. The employment of language reminiscent of building incidents and operations is not unfrequent both in the Gospels and the Epistles, sometimes in the way of direct illustration, and more frequently in the metaphorical expressions which, as Aristotle remarked, are of the nature of modified similes. These two forms are constantly liable to break into each other, especially under the influence of great excitement. Language resorts perforce to metaphor to compass the expression of mental states and operations; though, in process of time, some of the words which it applies in this manner become so entirely naturalised in what was at first but a secondary sense, as only in the faintest manner to recal the material fact which has been allegorised. So we speak of "edification" without the slightest thought of the building of a house, and of "supposition" or "superstition," without recalling any notion of the local relations of material objects.

The sense of incongruity is apt to be provoked by what is called a confusion of metaphors, when the metaphorical origin of more than one term in composition becomes too crudely apparent. We speak of "edifying the understanding" of the ignorant, without being shocked as we should be by the phrase of "building up the understanding," though it is a precisely equivalent expression. Poetry, which seeks for the most forcible and telling expressions, and usually has a predilection for the concrete and sensuous rather than the abstract, constantly ventures on most unscrupulous combinations, in the confidence that lively interest in the idea that is behind the expression will cause any such seeming confusion to be disregarded; or, in fact, that it will enhance the sense of excitement which can override such difficulties. When we are intent on the musings of Prince Hamlet we repel as prosaic and frigid an objection to the phrase, "take arms against a sea of troubles"; and who would have patience with the critic who proposed to clip the wing of the Theban eagle, and object to Pindar's boast, that he has "still in reserve a store of arrows vocal to the intelligent"; or wish Gray to suppress, "A heart once pregnant with celestial fire?"

The difficulty of a translation which is at once to be literal and conscientiously accurate, is increased by the fact that a word often has received a metaphorical extension, or application, in one language, which is not the case with its general equivalent in another. We have an example of this in the text,—"Upon this rock will I build my church." Neither in Classic Greek nor in that of the New Testament does the original word here, *ecclesia*, bear any other meaning than an assembly, or, strictly, a summoned assembly. The French *église*, which is derived from it, means both a structure and the congregation, like the English word "church"; and in both languages, therefore, a translation, with the best pretension to be literal, does not give the true limitation of the Greek word. With this limitation recognised, we observe what may be challenged as a confusion of metaphors in the original; but we are, in fact, witnesses of the first stage of a very natural metaphorical transition. It was not long before *ecclesia* came to signify, in ecclesiastical Greek, the material as well as the moral structure. Still, the difference in the case in question, so far as it goes, involves an apparently inevitable but still a mistranslation. In Acts ix. 31, we have,—"So the church [the revisers reject the reading *churches*] throughout all Judæa and Galilee and Samaria, had peace, being *edified*; and walking in the fear of the Lord," &c. The margin gives the more obviously literal "builded up." *Builded up* would probably have been taken into the text but for seeming to conflict crudely with the secondary meaning of "church," as well as with the next participle, *walking*; something might have been gained by writing *proceeding* or *going on* instead of *walking*, as the Greek word is general, and does not specify one form of locomotion; the resort to "edified" was, therefore, natural, besides having the precedent of the Authorised Version. It may, however, be doubted whether the truer equivalent of the Greek "builded up like a house," would not be "organised," as "edified" has come to imply very exclusively response to instruction, not regularity of arrangement. It is true that this proper architectural Greek phrase elsewhere claims *edify* as its true equivalent, as in "He that prophesieth edifieth the church." But nothing is more familiar to translators than the necessity of giving a different word occasionally for equivalent of the same, according to the indication of the context. The same Greek word has various shades of meaning, and we must detect from its associates in a particular sentence which of them is there selected and insisted on, and frequently renounce its exact etymological representative as not representing it faithfully.

Matt. xxi. 42.—"The stone which was set at nought of you the builders, which was made the head of the corner." This is a quotation from a Psalm (cxviii. 22), and criticism is thus perhaps bound in strictness to have regard to the Hebrew. Looking at the Greek alone, which follows the Septuagint version, we may not unreasonably demur to the translation *corner* when *angle* would be equally accurate, and more consistent with the associated terms. These imply that the stone was adopted for crowning an angle; but the crowning stone of one angle-pier out of four at least, does not imply the exceptional pre-eminence that the analogy requires, as one corner of a structure implies the existence of others, each capped in a similar manner, if capped with any distinctive ornament at all. Leaving the question of the Psalmist's exact meaning aside, we may conclude, with some confidence, that the notion in the mind of the Evangelist was that the rejected stone became the crowning stone of the angle of the pediment.

St. Paul especially abounds in metaphors and comparisons taken from architecture. After he has told the Corinthians that they are "the tilled land of God" which Paul planted and Apollos watered, he at once turns off to greater elaboration of a second metaphor: they are "a building of God." Paul, "as a skilled architect," laid the foundation; another is building thereon, "and if any man builds on this foundation, gold, silver, costly stones, wood, hay, stubble,—each man's work shall be made manifest." "Costly stones" of the revisers is an improvement on the "precious stones" it supersedes, but it may be doubted whether the word should not be "marbles" instead of "stones"; rare marbles were among the most costly and esteemed enrichments of the architecture of the age. The Greek word admits of either interpretation. It has been long ago well observed that the Greek word *oikodome* is appropriately expressive here of a building in course of construction, not a completed building. This is an example of a nicety to defy the most ingenious translator who is debarred from circumlocution.

1 Cor. iii. 16,—"Know ye not that ye are a temple of God, and *that* the Spirit of God dwelleth in you?" *Sanctuary* is given as an alternative in the margin, and it is better than the general word,—"temple." But even "sanctuary" is not definite enough to represent the original Greek word *naos*. The architectural student may be inclined to think that *naos* has now become a naturalised English word as much as *pronaos*, or *opisthodomus*. Its significance here is important; by derivation it distinctly imports an inhabited,—an abiding place, as it is the constant title of that chief apartment or division of a temple which contained the statue of the god or goddess of the dedication.

In the second chapter of the Ephesians the whole body of worshippers are set forth as constituting a *naos* of God, in a peculiarly descriptive passage. To make it clear, it is necessary to note that the Apostle is addressing not Jewish disciples, but converts from Paganism. "So, then, ye are no more strangers and sojourners, but ye are fellow-citizens with the saints and of the household of God, being built upon the foundation of the Apostles and prophets, Christ Jesus Himself being the chief corner stone, in whom each several building, fitly framed together, groweth into a holy temple in the Lord; in whom ye also are builded together for a habitation of God in the Spirit." So the revisers. A slight change, and yet not without value, to express the Greek more nearly would be to write, not "built upon," but "built up on," &c.

Here the word translated "chief corner stone," *acrogoniaios*, is the same which is found in the Septuagint (Isaiah xxviii. 16), where it appears clearly to refer to a foundation-stone. "Behold I lay in Zion for a foundation a stone, a tried stone, a precious corner stone, a well-founded foundation."—Sharpe's translation. This corresponds with its relation in the present passage of Ephesians. How, then, is it to be understood here? Apparently, as an angle-stone, defining and deciding the direction of the front and flank lines of the structure,—representative, in fact, of our modern ceremonial foundation-stone. The interpretation of the Greek word here, therefore, is, "of the extreme angle"; not as might have been inferred etymologically "of the summit of the angle." But this does not affect our interpretation of the extended phrase in Matthew, which was derived from a different Old Testament text, and where the notion of topmost position,—of heading or crowning,—cannot be got rid of, and where the conception is clearly that it is after the structure has considerably advanced that the stone put aside by the builders finds its ultimate exaltation to conspicuous honour, "In whom each several building" is surely incomprehensible; it will not "be understanded of the people," at any rate, as implying anything else than a number of distinct structures, and that is inconsistent with the unity which is presently insisted on so expressly. When we look at the Greek we are invited to conjecture that the revisers trust to their words conveying the idea of "in whom each several course of building"; but if this be so, they are imprudent. Samuel Sharpe, in his eighth edition of his own revised translation, which anticipated that under discussion a few months, writes "In whom all the building,—equivalent of "in whom the entire structure," which surely the Greek text demands. "Fitly framed together" is, again, an unhappily chosen phrase, as it is distinctly suggestive of wooden construction, of which the notion is here peculiarly out of place. The Greek participle employed (*sunarmologoumene*) includes the root of that *harmonia* which expressed the accuracy of jointing of the marble blocks in the temple architecture of the ancients. The tense, again, of the article is the pre;sent, and this not duly defined in the translation as a more exact rendering is offered "in whom the entire construction as it is being fitted accurately together groweth to a holy *naos* in the Lord, in whom ye also are builded together for a habitation of God in the Spirit."

Luke iv. 9.—"He led him to Jerusalem and set him on the pinnacle of the temple, and said unto him, if thou art the Son of God, cast thyself down from hence." The word "pinnacle" here represents the Greek word *pterugion*, as both etymologically signify a little wing. *Pterugion* is allied to, in fact, is the diminutive of, *pteron*, the current name of a lateral colonnade of a temple, and hence it has been referred to the Stoa basilica, the extraordinary height of which above the valley is insisted on by Josephus in terms that might seem extravagant but for the evidence of recent excavations. But the words cannot be interchanged; they differ essentially in their ruling associations. Whenever *pteron* is employed metaphorically, it is to express the lateral position of an architectural member rather than its form; but *pterugion* was familiarly expressive of pointed forms, and rather of forms pointed at an acute angle; it was the received name for the pendent corner of a robe, and is so explained in the Septuagint (1 Sam. xv. 27, &c.), and is so explained by the lexicographer, Hesychius, who, moreover, adds the further gloss, *acroterion*. This seems decisive, and we may confidently assume that the "pinnacle of the temple" referred to was the acute apex or summit of the temple proper, and had no reference to the subsidiary structures.

In the description of the city of the New

Jerusalem, in the Apocalypse, the Greek word *pylon* is translated "gate," with a reference to the note "*Gr.* portals," and the Greek word *themelioi* is translated "foundations." A few remarks may be made on both. Rev. xxi. 12.—"Having a wall great and high; having twelve gates," &c., "on the east were three gates and on the north three gates; and on the south three gates; and on the west three gates. And the wall of the city had twelve foundations," &c. "The foundations of the wall of the city were adorned with all manner of precious stones; the first foundation was jasper, the second sapphire," &c. "And the twelve gates were twelve pearls, each one of the several gates was of one pearl, and the street of pure gold," &c.

It would seem that the more important word "portal" might have been with advantage admitted to the text; as "pylon" is used in the New Testament to signify a construction which includes both a porch or vestibule and a door, and where magnificence was in question, must be supposed to have something of propylæan dignity. In Matthew xxvi. Peter follows at a distance as far as the *aule*,—the court or atrium of the high priest Caiaphas,—and when recognised there by a maid, goes out into the *pylon*, which the revisers here, without note, translate "porch."

As regards "the foundations," it is clear from their magnificence that we must understand by *themelioi* here, visible courses of construction, and, on the whole, less probably steps or stages of a basement than courses of the wall itself.

Thucydides, in a celebrated passage, uses the same word for the lower courses of the walls of Athens, which exhibited visible proof of the hurry in which they were commenced in the miscellaneousness of their materials,—funereal monuments utilised anyhow with the wrought stones.

THE CHEMISTRY OF BUILDING MATERIALS AND THE *RATIONALE* OF DAMP WALLS.

IN order to ascertain the comparative value of different building materials, some Continental architects have had the bricks, tiles, lime, sand, and other materials they use subjected to a more searching investigation than has hitherto been usual. As a rule, the materials of construction have only been tested in respect to their external appearance, their mechanical qualities, such as their strength and solidity, their hygroscopic peculiarities, their sound, and so on. While, of course, building materials should possess all indispensable physical qualities in the requisite degree, something more is necessary if we are to feel sure that they are capable of fulfilling their purpose under all possible circumstances. In other words, in addition to the usual physical tests, some examination into the chemical qualities of the various materials would be not only judicious, but also, in many cases, absolutely necessary. Thus an exceedingly common phenomenon, the snowy eruptions or growths appearing upon the walls of buildings, cannot be attributed so much to the defective physical condition of the materials employed in the buildings in question as to the fact that some of the substances used were chemically unsuitable. Moreover, the effect of such apparent corrosions upon walls is often under-estimated; for, indeed, there are no means, where such outgrowths occur, of stopping or counteracting them. All we can do is to leave the disease to run itself out and exhaust itself. This particular disease of walls, if we may so call it, will repay some further inquiry. It is instructive to learn what these white blotches are, and how they originate. There is no doubt that the cause of these appearances is to be found in the fact that hygroscopic salts were employed in the composition of the mortar, bricks, or other materials affected by them. Contrary to a very common and vulgar error, these blotches do not themselves consist of a decomposing or corrosive substance eating into the walls. They are simply the result of constant dampness, which by degrees dissolves some of the elements in the mortar, or other building materials, giving rise to the formation of fresh chemical compounds which force their way through the molecular structure of the material, and break out on the surface of the wall in a way somewhat similar to sores upon the human skin. The action is, therefore, from within and outwards to the surface, and not from the surface inwards. It is also quite erroneous to suppose that these blotches only show themselves for a short time, and then entirely disappear. What we see outside is only the excess or overflow of the compounds produced by the decomposition of the injurious salts within. Though nothing may be seen, the action may probably be still going on slowly but surely in the substance of the wall.

The commonest of these injurious salts holding and attracting moisture are,—1. Carbonate of soda ($Na\ O, C\ O_2$); 2. Muriate of lime ($Ca\ Cl + 6H_2\ O$); 3. Nitrate of lime ($Ca, N\ O_5$); 4. Sulphate of aluminium; 5. Sulphate of iron. The two last-mentioned compounds arise from the presence of sulphur pyrites. It is generally supposed that the eruptions in walls are due entirely to the mortar which is used. But this is not the case. If we examine the raw materials used in brick-making we find that the principal substance is clay; that is to say, aluminium-silicate. But often this is impure, being mixed with carbonate of magnesia ($Mg\ O, C\ O_2$), carbonate of lime ($Ca\ O, C\ O_2$), protoxide of iron ($Fe\ O$), sulphur pyrites ($Fe\ S_2$), and, in addition, organic remains. These, therefore, are the same elements as are found in the before-mentioned injurious salts. It may be concluded, then, that the formation of the eruptions on walls will depend partly on the quantity of these materials that may be present, and partly on the presence of any other substances capable of forming injurious compounds with the above materials. This latter point is of great importance in the investigation as regards bricks, tiles, &c. It is of importance not simply to examine the building materials themselves, but also the spot where they are to be employed upon an erection; and, further, to ascertain the composition of the sand, water, and lime with which the bricks are to be brought into contact.

With regard to the five special salts above enumerated, the following observations may be useful:—1. As regards carbonate of soda, this in itself is not an injurious salt, because it does not attract moisture, and therefore cannot be alone the cause of a wall being constantly damp. But if carbonate of soda be brought into contact or union with slaked lime ($Ca\ O, H_2\ O$), slaked lime being nothing more than the hydrate of calcium formed in ordinary lime-mortar, then the carbonic acid of the carbonate of soda unites with the oxide of calcium and with it forms carbonate of lime ($Ca\ O, C\ O_2$) and soda hydrate ($Na\ O, H_2\ O$). Now, soda hydrate eagerly absorbs moisture from the atmosphere. Accordingly, walls which contain it to any considerable extent constantly remain damp. Precisely the same reaction and the same practical result upon the walls of buildings would take place if, instead of carbonate of soda, there were carbonate of potash in the original materials.

2. With regard to muriate of lime; if in the preceding example, the cause of the eruptions lay in the lime of the mortar, the soda or potash being in the bricks, so the cause would have to be sought in the water of the mortar where there is lime in the bricks. Water is injurious, moreover, when it contains common salt in solution. Salt is a compound of sodium (or natrium) and chlorine ($Na\ Cl$). Now, chlorine, again, unites readily with calcium (the metallic base of lime), and with it forms chloride of lime. This, again, is a salt which eagerly attracts moisture. Moreover, it becomes soft or dissolves, and so acts very injuriously upon any wall or piece of brickwork containing it. Supposing, however, there is no lime, or not any appreciable quantity, in the bricks, then chloride of lime will be formed in the lime-mortar. This is, in fact, of constant occurrence, and the chloride of lime of course acts injuriously on the mortar. Water containing salt is thus one of the most dangerous elements as regards the dampness or eruptions on walls. The builder must, therefore, take care to avoid using it under any circumstances. Even the sand employed in making mortar may contain salt, and, if so, should be entirely rejected for building purposes. Very often the eruptions do not make their appearance on the surface of the bricks, but are found on their edges or in the intervals and interstices between them. In such cases it is safe to conclude that chloride of lime is present, and that it arises from the union of salt contained in the water with the lime of the mortar.

3. Nitrate of lime. This is the best known form of the salts we are speaking of. The eruptions on walls are often called saltpetre. Ordinary saltpetre is nitrate of potash (KO, NO_5), but the eruptions on walls are oftener nitrate of lime or nitrate of soda, and sometimes nitrate of magnesia. Saltpetre is most readily formed under the following conditions: — (*a*) when decomposing nitrogenous substances are present; (*b*) when there are alkaline earths present, and the air has ready access,—in other words, when the material is porous; (*c*) when the spot is moist or damp; and (*d*) when the atmosphere is warm. It is easy to see that these conditions are seldom all to be found in the bricks themselves, except in those cases where the original materials contained vegetable substances, and therefore nitrogen. It is the presence of nitrogen which is the principal cause of the formation of the so-called saltpetre of damp walls. However, nitrogen may be conveyed into bricks in very various ways, and if the conditions mentioned under *a*, *b*, and *c*, above are present, and therefore if the bricks contain alkaline substances (as is frequently the case if they are porous), and if there is both moisture and heat, then we may expect to see the saltpetre excrescence formed. The elements containing nitrogen which we may expect most frequently to find acting on the bricks, may be,—firstly, the air; this being itself a mere mixture of seventy-nine parts by volume of nitrogen to twenty-one of oxygen; the air, moreover, contains numerous nitrogenous particles, floating about in the form of dust; secondly, the nitrogen may come from the water, and the impurities it contains; or, thirdly, it may come from the ground, and especially the *humus*, which is full of decomposing animal and vegetable matter.

The process or reaction which goes on may be thus described. If ammonia ($N\ H_3$), along with lime ($Ca\ O$), magnesia ($Mg\ O$), potash ($K\ O$), soda ($Na\ O$), and a certain amount of moisture come into contact with decomposing substances, then, the elements of the ammonia (nitrogen and hydrogen) being themselves separated by the action of the atmosphere, the decomposing substances unite with the oxygen, forming water ($H_2\ O$) and nitric acid ($N\ O_5$). If now the latter finds alkaline earths, as above enumerated, in the substance of the bricks, then all the conditions are favourable for the saltpetre eruptions on the walls. Thus we may expect to find nitrate of lime, nitrate of magnesia, nitrate of potash, and nitrate of soda, or one or more of them. All these salts attract moisture from the atmosphere, and thus, through keeping the bricks constantly in a damp condition, they lead sooner or later to the permanent injury or destruction of the wall. Since, therefore, the ground or soil itself may contribute so materially to the production of the saltpetre on bricks, the conclusion to be drawn is that we ought never to employ bricks in laying foundations, or use them for walls that are in contact with the soil.

4 and 5. We must here speak of the bricks which are made from a clay containing sulphurous pyrites ($Fe\ S_2$). Through the burning of the bricks there are formed acids containing sulphur, and these, by taking additional oxygen from the atmosphere, become oxydised into sulphuric acid ($S\ O_3$). But sulphuric acid again unites in part with the clay, forming a clay sulphate ($Al_2\ O_3, 3\ S\ O_3$), while with the iron of the pyrites it forms protoxide sulphate ($Fe\ O, S\ O_3$) or iron vitriol. Both these salts are hygroscopic, and keep the bricks containing them continually in a damp state. Hence clay containing sulphur pyrites is altogether objectionable for brickmaking, and should be wholly avoided.

Herr E. Müller, from whom we have taken the above facts with immaterial alterations, draws from them one or two practical conclusions. He thinks that in every important contract there should be a clause providing for the "examination and testing of building materials." The cost of a thorough testing would not be large. He recommends that samples of bricks should be submitted by the contractor to the scientific chemist, who should ascertain whether they contained soda, potash, magnesia, organic substances, or sulphur. These are the dangerous elements, as they form the foundation of all the injurious combinations that lead to saltpetre growths and damp in walls. If the bricks are free from these elements, the substances they combine with from the air, water, ground, mortar, &c., will be harmless. Up to the present time we have no experiments showing how much per cent. of the above substances may be in the bricks without material injury. Herr Müller holds that it would be of great value for our knowledge of the subject if extensive experiments were made in order to arrive at some standard in regard to the chemical purity of building materials. If a commonly accepted scale could

be arrived at, brickmakers would soon find the means of furnishing an article which should conform to it.

OMNIBUSES IN LONDON.

IT is with much satisfaction that we have seen the announcement of the formation of a company to improve and increase the omnibus service of the metropolis. If the programme of the Railway and Metropolitan Omnibus Company is fully realised, we most cordially hope that it will succeed financially, and become a boon to many dwellers in this immense city. This is not the first time that we have alluded to the subject of the omnibus service of the metropolis, and while we have pointed out that in the interest of those who dwell in London many improvements were required, we have always felt that though legislative action might mend matters, yet business competition was the surest way to effect the desired object. An improved omnibus service must be a matter of interest to many classes of our readers. There are those who use omnibuses, or who desire to use them, for their own purposes; and there are those who, being owners of house property, cannot fail to realise the importance of any increased means of access to their property; for there are many parts of the metropolis which must always be more effectually ministered to in the matter of locomotion by omnibuses than by railways.

There was a time when it was considered to be hardly respectable to be seen on an omnibus, and even yet there is a certain *mauvaise honte* visible in a man whose richer or more luxurious friend meets him as he emerges from the interior of a public omnibus. In truth, it is ridiculous that such a feeling should exist, and, on the other hand, it is a disgrace to our day that persons should not be able to travel about the metropolis more comfortably and more rapidly in general public conveyances than they can do at present. It is the habit, and perhaps often not an unreasonable one, to abuse the railway companies, but certainly the London General Omnibus Company disregards the comfort and convenience of its customers,—and they are practically the whole inhabitants of London,—more callously than any railway company. How often have letters appeared in the papers urging more comfortable and commodious vehicles, more punctuality, the issue of day and season tickets, better lighted interiors, waiting-rooms, and so on, without any response from the company, who go on paying twelve per cent. to the shareholders and provide one dim oil lamp inside their omnibuses?

If a moment's consideration be given to the subject, it is clear that there is no reason why omnibuses should not become as regular and almost as commodious as railways, allowing always for the roughness of roads compared to the smoothness of rails. There is no substantial reason why there should not be first and second class omnibuses, the former for ladies and those who preferred economical and yet fairly comfortable travelling, the latter for those who preferred cheap and somewhat rough locomotion. There are scores of well-bred and cultivated men and women who would now use omnibuses if greater attention were paid to punctuality, comfort, and convenience. In no city in the world are there more wealth and more magnificent equipages than in London, but in no city is there a larger mass of gentlemen and ladies of moderate incomes who will make use of any respectable conveyance which is at once inexpensive and reasonably satisfactory. Locomotion is a necessity in a town such as London; the local railways by no means supply the whole demand, and, year by year, they become more crowded, and there are scores of persons who would gladly use a comfortable and reasonably expeditious over-ground means of locomotion if they could. In the large provincial towns, such as Liverpool, tramways are being rapidly developed, and are meeting the desire for comfortable and expeditious public vehicles. In London, except on the outskirts, tramways are of no assistance to the person who has to move about, and therefore he depends entirely on the railways, omnibuses, and cabs. Therefore, it is obvious that a really satisfactory omnibus service must always be a boon to all Londoners, and is certain to be welcomed by all occupiers of houses and by all owners of property. Take, for example, the large and populous district which lies between Kensington-gardens and the West London and North-Western railways. Any one from this district who desires to go to Regent-street, for example, must either go by omnibus or cab, and yet year after year the slow and inconvenient style of omnibus continues to plod between Hammersmith and Piccadilly. Therefore it becomes obvious that all occupiers and house-owners should encourage every attempt, such as that which this new company appears about to make, to give London a quick, punctual, and comfortable service of general public conveyances. We know not what the prospects of the management of this company may be, or who its promoters are, but for the sake of the vast mass of Londoners who have the need to use these conveyances, and as the company bears the appearance of a genuine attempt to minister to the needs of the inhabitants of the metropolis, it deserves a passing notice of welcome.

THE USE OF MARBLE AND SIMILAR MATERIALS IN ENGLISH ARCHITECTURE.*

THE subject of my paper is the use of marble and similar materials in English architecture. Among these materials I include all those stones which have a slight degree of translucency and will take a polish, and which are valued in architecture either for their beauty and variety of colour,—as, for instance, the veined and breccia marbles, porphyries, serpentines, and some kinds of alabaster,—or else for their delicacy and purity, and the closeness and fineness of their texture, as in the case of statuary, Parian, and white alabaster.

I have chosen this subject because the opportunity we Englishmen have now for using materials of this kind in our work is something novel in English architecture, and because, unless we recognise this novelty, and try to ascertain the proper principles by which to employ this new material, we are not likely to employ it well.

It is true that it was not an unknown material in Mediæval England. This could hardly have been so, for in Devonshire it is a common building stone, and every shower of rain makes the smooth flagstones of Plymouth look like slabs of polished marble. It would be more correct to say, that, though not unknown, it was almost ignored. And it was ignored not so much from choice as from necessity. M. Viollet-le-Duc observes that in France, where the use of marble during the Middle Ages was as rare as with us, if not rarer, romancists were fond of writing of marble palaces, and so forth, and that the chroniclers of the Abbey of St. Denis boast of the marble columns with which Abbé Suger surrounded the choir, which, however, turn out, after all, to be only of stone. It is most probable that the expense and delay of working marble was the real reason why it was neglected in a style which was the child of economy, and in an age when labour was costly and labourers few. However this may have been, in the earlier styles of our native architecture it is the fact that, with the exception of the simple grey marbles of Purbeck and others like them which were employed chiefly in shafts, the use of marble was neglected.

In the later periods of Gothic art, alabaster, which is soft and easily worked, came into use for monuments and reredoses, and similar small works; and, still later, marble was used a good deal in our English Renaissance, though even then chiefly in small work, such as monuments and chimney-pieces. The marbles then employed seem to be chiefly foreign, and to have been regarded as a rarity and used with economy.

It has been reserved to our own age, when steam transport by land and sea has relieved us of the necessity of using only local materials in our works, and when provincialisms in architecture seem destined to give way before a more general interchange of materials and modes of workmanship, to have marble brought to our doors so easily, and in such quantity and variety, that it fairly takes its place as one of our building materials.

Now, to those who take what I believe to be the right view of our position in the history of art,—who recognise the fact that we live in an age which is necessarily eclectic; building up for ourselves an art out of the teaching, not of one only, but of many bygone styles, all more or less unsuitable,—and who look forward to the development, in due course, of a really modern art which will represent us better,—the acquisition of a new material will be welcome as opening the way for a fresh departure in our practice. For every special need of our life which is met and satisfied, and every new material which is adopted and put to its proper use, must involve some modification of the adopted styles we work in; and each such modification, if made in accordance with true artistic principles, or, what is much the same thing, common sense, must result in genuine progress.

There is no need to urge the use of marble on modern architects. Ever since it has been easy to have it, there has been no lack of demand for it, and this is not wonderful. The first impulse seems to have been given by the books of Mr. Ruskin and Mr. Street. Delighted to find himself allowed and even encouraged to indulge himself in the study of a branch of Gothic architecture which had been forbidden by the sterner masters of Gothic purism, the student rushed to Italy and found there wonders of colour and exquisite finish of workmanship for which his Northern training had in no way prepared him. Accustomed to regard a 4 in. marble shaft as an extravagance, and an alabaster pulpit or font as a matter for glorification, he suddenly found himself in a country where marble was used as a common building stone. The sensation with which, for the first time, one stands in an Italian church, such, for instance, as that of St. Lorenzo at Genoa, where arches and walls of banded black and white marble are carried on closely serried ranks of massive columns of deep purplish red, is one of astonishment mixed with incredulity. And as the student travels further and becomes accustomed to see marble used universally for purposes where, in his less favoured land, common stone would have been employed, his satisfaction grows in proportion as his wonder lessens.

To many students after an Italian tour,—at all events, a *first* Italian tour,—the return to sober stone is like disenchantment, and it is no wonder that they seize every opportunity of using the material which has charmed them under an Italian sky. With this desire I have no wish to quarrel. We may safely welcome the new material and use it freely, provided we learn to use it properly and do not forget that it *is* a new material in English architecture, and that as a simple consequence its adoption must bring with it new methods and principles of design.

I propose to-night to touch successively on a few of the principles of design by which the effects which we admire in the marble work of the past have been produced; and to show how, by the neglect of these rules, we moderns have constantly failed to succeed in making the most of our new material; and how we have sometimes even spoiled what might otherwise have been tolerably good work, by the improper use of a material which would have improved it had it been judiciously employed.

The first thing to be insisted on is that marble is not, as some seem to think, merely a more beautiful kind of stone, which may be used just where and how we might use stone, but with a correspondingly more beautiful effect. Marble has other differences from ordinary stone than its superior beauty. In the first place, it is generally much harder, and to work it involves infinitely more labour; in the next place, it has a slightly transparent quality, which requires special kinds of design to make one's work upon it tell distinctly; and again, in the case of coloured marbles, we have a totally new field of design opened to us differing from any that mere stone-masonry offers. All these points involve new considerations to one who has been trained exclusively in the Northern schools of Gothic architecture, which are distinctly *stone* styles. Their deeply-recessed orders, undercut mouldings, and elaborate traceries, the highly-relieved character of their decorative sculpture, especially the naturalism of some of it, are all derived from the use of stone, and are appropriate only to a soft, easily-worked material. There is nothing here to teach us how to make the best use of our new material. It is only from those who have been used to work it that we shall learn how to deal with it, and it is, therefore, to Italy that the student must look for instruction. In that country marble has always been a possible and the favourite material, and the true principles of working it have never been entirely forgotten. From the time when the Gothic or Lombard

* Paper read before the Architectural Association, on the 27th ult., by Mr. T. G. Jackson, M.A.

builder first began to carve rude marble capitals of his own by the side of those he pilfered from the ruins of antiquity, down to the time of the Renaissance, when perfect knowledge and unrivalled skill in dealing with marble seemed to make that stubborn material as plastic as clay in the artist's hands, we find it employed sensibly and with proper economy,—by which I mean that no labour was unprofitably spent on it, and that the workman succeeded in producing the desired effect with the least possible fatigue.

The principles of work according to which this result has been obtained are simply those by which every good school is guided; they are the same which, working under different conditions, produced the totally different styles of France and England. Decorative sculpture north of the Alps owes its character to the stone in which it was cut, and that south of the Alps to the marble in which it was cut, because in both styles the workman recognised and respected the qualities of the material he was at work upon; and as he worked in the direction which these qualities suggested to him, his work fell naturally into such a shape as best brought out the beauty of his material with least labour to himself.

For instance, the first consideration of a sculptor or mason in marble would naturally be the hardness of it, and the time his work would occupy him. Every deep line in the foliage of his capitals would have, first of all, to be drilled out with a succession of holes, which would afterwards be joined together with the chisel into a regular sinking. This laborious method is of itself enough to confine the carver to a stiff and regular mode of design. Of what use would it be to him to think of imitating the wild freedom of the stone carved capitals of the North, which have all the rapidity and boldness of a sketch, where we see that a few vigorous blows have sufficed to give a depth of shadow that it would take a week to produce in marble, and where is an easy play and variety of line that can only be had where the chisel travels easily and freely, and finishes at once? To imitate this free work in a stubborn material is an artistic mistake of the first order, of which examples are not wanting even in old work. Most of you may be acquainted with the spiral colonnettes in the north and south portals of Chartres Cathedral, which support, if my memory is correct, the statues lining the jambs. The hollows of these twisted shafts are stopped by exquisite little bunches of leaves carved with a freedom and grace that have seldom been surpassed. They were evidently struck off in a happy vein, and quickly finished while the mood lasted.

You may not all be so well acquainted with the front of Orvieto Cathedral, but those of you who have seen it may remember the spiral shafts of the doorways with their lovely mosaic inlay. The architect has there tried a similar plan of laying natural leaves at intervals in the hollows of his shafts, but with a far less satisfactory result. The freedom of the French example is entirely wanting. The leaves look laboured and heavy and leathery for they took so long to work that all the zest of the original idea evaporated before they were one quarter finished.

To illustrate the difference between the two modes of work in the two materials, I may turn to the difference between an etching and an engraving. The etcher's needle travels sweetly and smoothly over the varnished plate. He can sketch as he goes on, with the utmost freedom, and finish his work a hundred different ways, whereas the engraver has laboriously to plough out line after line, to lay them parallel to each other, and to work evenly, regularly, and methodically. Just so the marble carver. He must lay his lines firmly and positively in their right places, and work them out slowly and painfully. There is no rapid sketching for him; and therefore he cannot hope to succeed in those designs which answer best with rapid handling.

In this I believe we find one key to the greater conventionalism of the decorative carving of Italian art, and perhaps even to that of Classic art itself. The stiffness of the material led to stiffness of design, except in cases where labour could not be misapplied nor the sculptor's interest exhausted, as in the human figure. It would not be wearisome to carve a block of marble into a Corinthian capital, or one of those conventional capitals of the Early Renaissance, of which there is such an infinite variety, because its very regularity and symmetrical perfection precludes the idea of its being done otherwise than with care and pains, and in a considerable time. You are in no hurry to embody your idea before it escapes you, for you have laid down your outlines correctly from the first, and have only to fill them up. It is natural that work such as this, which takes a long time and considerable labour, should bear the stamp of laboriousness, careful arrangement, and perfect execution, rather than that of facility and freedom; and when the mechanical labour is so great as it is in the case of marble, it is natural that a great part of the less important ornament into which it is worked should be mechanical too. Hence, no doubt, the frequency in marble of such conventional ornaments as the egg and dart, and similar enrichments of Classic mouldings, which occur in Italian work, even during the Middle Ages. The freer design of Northern carving is enjoyable only so long as it can be cut freely, and to carve it in marble would be tediousness itself in comparison with carving the other more conventional ornaments I have named.

There is, however, a free outlet for naturalism in marble, of which neither the ancient nor the modern Italians have failed to take advantage. It lies in the opportunity of working in low relief. In common stone, considerable relief is generally necessary, partly because most stones have a coarseness of grain which interferes with a very delicate finish, and partly because even if the stone is fine enough it is seldom so hard as to make a low-relief durable enough to resist ordinary wear. But marble is so fine of texture that every touch tells, and so hard that the smallest amount of relief may safely be trusted to last. I think no decorative sculpture shows more astonishing ability and more perfect appreciation of the material employed than some of the slighter reliefs of Italian art. Effects of perfect solidity and modelling are produced with the relief of a bare ¼ in., and some of the finer lines are actually not relieved at all, but marked by a slight sinking of the ground or incising of a line round them. Here the labour is in comparison slight, and in the arabesques which cover the surface of the monuments of the Renaissance there is the utmost ease and grace and freedom of line, and often the most charming naturalism. But, above all, the Italian found room for naturalism in the representation of the human figure. There the labour required by the material suits the nature of the subject. In figure-carving there is no room for hasty suggestive work, all must be complete and well studied, and finish can hardly be carried too far. The superior artistic value of the work also seems to demand the most durable of materials, marble or bronze, and to repay any expense of time and labour. There is no fear of the artist tiring of work that he feels to be worth the trouble he bestows on it.

I turn now to another property of marble which distinguishes it from stone,—its variety of colour. This introduces us to entirely fresh considerations, even more foreign to our native styles of architecture than those of which we have been speaking.

At the beginning of this paper I distinguished two uses to which marble can be put, and for which it is valuable:—1. The beauty and variety of colour of some kinds; 2. The compactness of texture and simplicity of colour of others. Now, though from one point of view we are in either case dealing with the same class of materials, from another point of view we are dealing with materials of two totally distinct kinds. They are distinct as the beauty of form is distinct from the beauty of colour. This is so simple a distinction that it seems at first sight hardly worth enunciating, and yet there is no more common error than to confuse it. Marble that is valuable for its colour, is valuable for that alone. Nothing else ought to be present to our minds when employing it. To carve it is, except in very rare instances, a monstrous violation of the first principles of art. If, then, a marble, besides being coloured, has any *variety* of colouring, it is absurd even to work mouldings on it; and yet this is a thing that is done every day. The architect wants a marble base or capping, and fixes his affection on a lovely block of breccia mottled with yellows, reds, and blacks, on a nearly white ground; or a scarcely less beautiful piece in which strong white and coloured veins cross and recross one another, or lie obliquely along the surface. On this he works the rolls and hollows of his base, or the details of his cornice, and is disappointed to find the result is not equal to his anticipations. The lines of the colouring contradict and confuse those of the mouldings. One does not know which to look at, the lines drawn by nature or those cut by the chisel. The level lines which are necessary in such features for the proper architectural effect are upset by the irregular markings of the material, and the beauty of the markings themselves is destroyed by their being broken into by the mouldings, which distort them just as a drawing is distorted when rolled up. The mistake is simply this, that the radical difference between designing for form and designing for colour has been ignored. The effect is almost as bad when strongly-marked marbles, such as many of the Devonshire varieties, are used for steps. The effect of a flight of steps (and there are few more dignified features in architecture) depends on the regularity and evenness of the lines, and the simple alternation of light and shade in tread and riser. All this is destroyed by veins that run obliquely, and so distort the horizontal lines, or by strongly-massed colours, which interrupt the simple breadth of light and shade. In all the instances which I have given, the architect, caught by the beauty of the material, has thought that it would be sure to beautify anything he might use it for, and, having used it for an improper purpose, he ends by destroying both the form of the object and the beauty of the material. No material is worse abused at the present day in this respect than alabaster. Alabaster costs less than marble in the block, and being much softer costs less in labour, and, consequently, is much cheaper as a material, and is, therefore, readily accepted as a substitute. With a little trouble it may be had quite white; but, as a rule, it is more or less strongly veined with warm brown streaks; and, strangely enough, it is this coloured alabaster that seems most popular, not only for plain work, but for sculpture. The absurdest effect is sometimes produced by its employment for groups of figures in a reredos, when the brown streaks run undistinguishingly across the face of an apostle or the drapery of a saint, blurring the features of one and confusing the flowing lines of the other in the most distracting manner.

The plain rule for all kinds of varied marbles is that they should never be used except for their colour, and in such a way as to make the most of their colour. They should be used in flat slabs, inlaid in panels, like pictures, or used for lining the surfaces of walls or large compartments of pavements, always in large enough pieces to allow the variety of the markings to tell; for, of course, if they are cut up into small pieces they will differ but little from self-coloured marbles. One very sensible way of using them is by splitting and reversing them, so that the veins and markings form regular figures, like the patterns formed by a kaleidoscope. This was very commonly done in Byzantine work, and may be seen at San Vitale, Ravenna, and St. Mark's, Venice, and also, in later times, as in the palaces Vendramin Calerghi and Corner Spinelli on the Grand Canal, designed by the family of the Lombardi at the end of the fifteenth century.

Perhaps the only lawful occasion for the use of variegated marble for actual parts of the architecture is that afforded by columns. Their form is so simple and clearly defined that the irregularities of the marble cannot confuse it, and the cylindrical surface is as well adapted for displaying the beauty of the markings of the marble as a flat surface would be. But such marbles should only be used for *plain* columns. If the columns were fluted the beauty of the material would be seriously diminished.

The rule to employ a coloured marble, for the sake of its colour only, will, to a certain extent, apply also to self-coloured marbles, which have no variation of surface. The instances in which sculpture can be successfully applied to any but white marble are very rare, even if they are admitted to exist at all. I do not forget the Egyptian figures in black stone, porphyry, or granite, nor the red marble lions that carry the columns of the Lombard porches in North Italy. But it may be observed that these are all archaic works that stand very low in the scale of sculpture, being conventional and abstract to a degree which we are not likely to imitate, and indeed could not imitate without affectation.

But the prohibition against the use of coloured marbles for our more developed sculpture need not prevent us from working mouldings on it, for if the colour be but uniform the mouldings are as well seen in one colour as in another, or

even as in white. For bases, cornices, architraves, and steps, therefore, there can be no objection to the use of marbles, such, for instance, as the Veronese red, which is employed with such good effect in the north of Italy, or the black, which gives such dignity to many interiors in the Low Countries.

Whilst we are on the subject of coloured marbles, I would touch upon another rule, and a most important one; that is, to work with moderation, and a limited palette. The same rule applies, more or less, to all decorative arts. The breach of it has done more to degrade modern glass-painting than anything else. Seven tints of glass, I believe, sufficed the glass-painter of the thirteenth century, and with them, and no more, he produced those miracles of gorgeous colour which we see at Chartres, Bourges, and Canterbury. A similarly-restricted palette was enough for the wants of the artists of the fourteenth and fifteenth centuries. The result was a harmony of colour and a simplicity of composition that were admirably suited to the purposes of architectural decoration. The modern glass-painters have, I believe, the choice of about 400 different tints, and many of them seem to avail themselves of the liberty of choosing without restraint, not with the happiest results. The only modern glass that is worth looking at has been designed on totally opposite principles, with but few colours carefully selected and artistically composed. And in the same way, in the arrangement of marbles, there can be no greater mistake than to use many varieties in the same composition. There are very few designs for which three kinds of marble would not be enough, or in which there would fairly be room for more. The marble screens of the Low Countries afford a good instance of the satisfactory application of this principle. One of the finest of them,—now removed, unfortunately, from its original site in the cathedral of Bois-le-Duc, and preserved, fortunately for us, in our museum at South Kensington,—is an example of the kind of screen I refer to, of which there are scores in the great churches of the Netherlands and French Flanders, beginning with the old church of Notre Dame at Calais. In this magnificent structure there are but three marbles employed, —black, white, and red,—and they are used according to the principles I have endeavoured to put before you. The white is used for sculpture, the black (which is of one simple tone) for the moulded architectural work, and the red, which is variegated, though of a very sober tone, for the columns.

There is another lesson to be learned from the practice of the best schools as to the usefulness of working with moderation and self-restraint in a material which offers so many temptations to over-display as marble. The beauty of some of the variegated marbles is so great, and their colours so powerful, that they often exercise a seductive influence on those who have had little experience themselves in the use of marble, and have paid little attention to the practice of those who have had more. Caught by the splendour of these more gorgeous varieties, they neglect the soberer kinds, and they arrange their magnificent materials so as to produce the most powerful contrasts and the most gaudy combinations. No marble has been more popular in modern churches than a brilliant light-green Irish marble, which is in itself of an almost hopelessly impossible colour to work with, which is often made still more offensive by being placed next a bright red. Such gaudy combinations as these are enough to vulgarise any design, and are quite at variance with the teaching of all the best schools, which employed not only very few marbles at a time, as I have just explained, but generally preferred those of soberer colours, and avoided strong contrasts. Indeed, when one is new to the study of Italian art, and when the first rapture at the wealth of marble that surrounds one is fresh, one is disposed at first to wonder why strong contrasts were so seldom resorted to, and why, when so many splendid marbles were to be had, the quieter specimens were preferred. A structure of white marble will often be relieved only by panels of pale breccia, as at the Giant's Staircase at Venice, selected evidently for their light colour and amount of white ground. At the Scuola di San Rocco, one of the most lovely and refined works of the early Renaissance, the principal staircase is designed with still greater delicacy, the white marble being inlaid with slabs of a pale warm grey. In the presence of work such as this it is only the young or inexperienced architect who will wish for more colour and decided contrasts. Those who have any real sense of art will soon learn to appreciate at their true value these quiet harmonies and subtle combinations of tints.

It is, however, only on a large scale that the Italian masters dreaded and avoided strong contrasts. In their smaller inlays and mosaic patterns they sought brilliancy and distinctness, and used the strongest contrasts, not only of colour, but of light and dark. Strangely enough, it is in small work such as this that modern men seem to choose marbles that will not contrast, and arrange them so as to produce no decided effect. That disagreeable Irish green, of which I have spoken, is often used next to a piece of pale red, without that intervening white or black which would have prevented their running together, and the result is a confused piece of colour that has none of the brilliancy that is essential to design in mosaic. The true masters of mosaic worked in a very different way. They chose strong positive colours, the dark red of porphyry, and the deep green of serpentino, if they could get them, and almost always separated them by white, or pale yellow. A beautiful effect is produced in the enclosure of the stalls at the Baptistery of Pisa by simply inlaying a dark green marble in the white marble of the enclosing wall, so as to form a pattern in dark green and white, of which the white is the actual material of the ground left between the dark inlaid pieces.* This kind of sharp trenchant design is the descendant of the old Lombard inlaid work, such as that in the Duomo and San Michele at Lucca, and San Miniato at Florence, and it was continued in a later form in the incised work filled in with black marble or cement, of which there are examples in the doorways of the Palazzo Communale at Cremona, the screens at San Petronio at Bologna, and some fountains now in the South Kensington Museum.

Here, again, should be noticed the very limited number of colours with which these mosaics or inlays are worked. In the glorious pavements of *opus Alexandrinum*, which cover the floors and add so much to the beauty of the Roman basilicas and innumerable other churches in Italy, and whose beauty is not less remarkable than their variety of pattern and design, there are seldom more than three kinds of marble used,—red porphyry, green porphyry or serpentino, and white; the white, however, generally cut from a marble which has veins of other colours in it, so that the piece which, according to the pattern, ought to be white, is sometimes yellowish or pinkish or grey instead, and a certain amount of variety is thereby obtained, which prevents the hardness of a perfectly regular mosaic. The patterns thus produced are inlaid in a plain white marble field, and with these simple materials effects are produced which are not only harmonious, but constantly novel, each pavement having its own distinguishing character, by which it can be distinctly remembered.†

I turn now to another rule for the employment of marble, which may not be generally accepted, but which seems to me of no less consequence than the rest. Marble differs from stone, not only by its superior hardness and by its qualities of colour, but by its semitransparency and the polish which it takes. The combination of these qualities, but especially the last, make it difficult to use marble and stone together in the same design. Carving in stone must be free, that in marble severe: design in stone must be well relieved, and expression must be given to it by architectural features; design in coloured marbles must be plain and flat, and characterised by smooth surfaces of colour; and on these grounds alone the two materials can scarcely be used safely together. But the contrast between the opaque granulated texture of stone and the polished semi-transparency of marble is so great, and the effect, when they are placed side by side, is so disagreeable, as to be intolerable to an educated eye. If the marble is not polished, the contrast is more endurable; but then, of course, the full beauty of the marble is not brought out, and it is no better than coloured stone. It is less intolerable when marble is used for detached shafts, though even then it is a question whether simple stone would not have been better. The instance of the frequent use of Purbeck shafts in our English cathedrals is, I am aware, an authority that may be adduced against my rule, but I venture to think that even they are not always an improvement to the design; and it should be remembered that originally they did not stand as they now do,—stark and sharply-defined against white stone,—but were supported by coloured decoration on wall and pier, which has now disappeared. But if the sober grey of Purbeck may be forgiven, what shall we say for the multitude of marble shafts of all colours and sizes that one sometimes sees in modern churches,—round the pulpit, perhaps, a dozen little colonettes, 2 in. in diameter, and round the font half as many more, all of different kinds and colours, reminding one of nothing so much as the samples of polished drawing-pencils in a colourman's window; and then, perhaps, on the piers or the jambs of the chancel-arch, large shafts of Cornish serpentine that look nearly black and shine beautifully, all standing in hard cold relief against common stonework, and grating on the nerves by the disagreeable contrast between its dead surface and softened outlines and their glossy polish and hard positive forms? It is a safe rule that marble and stone should not be combined in the same design. If ever it is necessary to bring them near one another, let there be a strong definite line of separation, and let there be all marble on one side of it, and all stone on the other; so shall we minimise the unpleasant effect which almost always arises from the combination of materials so different.

These, then, are a few of the lessons which are taught us by the nature of marble and the other materials which I have classed together with it, and by the practice of those who have every claim to be considered as our masters in the use of them. Let me briefly recapitulate them:—

1. Decorative carving in marble, as, for instance, in cornices, capitals, and friezes, where high relief and bold design are required, should be severe and conventional. Naturalism is forbidden by the stubbornness of the material except in the highest subjects, such as the human figure, which repays the necessary expense of labour, or else in very low reliefs, when the labour of execution is reduced within moderate limits.

2. Sculpture should be in white marble, or, if in alabaster, only in such as is free from veins or stains of colour.

3. Moulded architectural features, such as bases, bands, strings, cornices, architraves, abaci, should be either in white or in some uniform colour without markings or veins.

4. Variegated marbles should be used only for panels or columns, or, in other words, on plain smooth surfaces, either flat or curved, so as to display the beauty of their markings to the utmost without interfering with any of the structural lines of the architecture.

5. Coloured marbles should be used in moderation, too great a variety being avoided, and those of the quieter and more harmonious tones preferred for general use.

6. Strong contrasts of colour on a *large* scale are dangerous, and generally incline to vulgarity.

7. Strong contrasts on a *small* scale, as in mosaics and inlaid work, are necessary.

8. Stone and marble should be kept apart as much as possible.

In conclusion, it will be useful to consider how far, with these principles to work upon, marble is suitable to our English architecture. Most of the rules which I have just recapitulated, and which are derived from observation of the material itself, and the modes of using it which have been suggested and taught by its natural qualities, seem to point rather to Classic than to Gothic design. Severe conventional foliage, restraint imposed on freedom of representing natural forms, large plain wall-surfaces, and large columns, all seem to belong to Classic architecture rather than to our native Northern styles, which delight in naturalism, break up the wall-surfaces with variety of architectural features, and compose their piers of small clustered shafts in preference to single columns, being in everything the very opposite of the mode of design which marble seems to require. And, indeed, I have no doubt, as I have already implied, that the qualities of marble have had as much to do with forming the character of

* Several examples of inlaid work similar to this, in dark green and white, or with the addition of a dull red as a third colour, are illustrated in Waring's "Arts connected with Architecture in Central Italy." Plates 22 to 30.

† Several pavements of *opus Alexandrinum* are illustrated in Sir M. D. Wyatt's "Geometrical Mosaic of the Middle Ages" (*vide* plates 1 to 7). Restraint in number of colours may also be observed in the illustrations of decorative art in other materials in the same volume. See also Gruner's "Specimens of Ornamental Art."

Classic architecture, as those of stone with that of Gothic architecture. The very forms of Classic mouldings, with their square reveals and absence of undercutting, seem derived from the difficulty of working marble into hollows, and the necessity of right-angled sections, to throw distinct shadows in a partially translucent and strongly-reflecting material.

But it does not follow from this that, unless we give up Gothic architecture, we must give up the use of marble; nor even that we must give up our Northern Gothic and adopt that of Italy, which is in many respects a marble style. Our native Gothic is the result of our native climate, and our own natural character; and I for one believe firmly that no style will ever firmly root itself among us which is not at bottom based on the art which sprang up among us spontaneously, and which in country districts retained an obscure lingering existence all through the reign of pure Classicism and down to our own days. But our architecture may still remain true to Gothic principles in spite of our adoption of materials and conditions for using them that are new to the Gothic of the past. For instance, the art of the Early Renaissance among us is much more a Gothic than a Classic art. The mansions of Kirby, Hardwick, and Burleigh, in England, and those of Chambord and Blois, in France, have nothing in common with Whitehall or Versailles. They are in principle Gothic buildings, in spite of the features and ornaments they have borrowed and adapted from Classical architecture. It was not until the Gothic element in the Jacobean style dropped out, and the temptation to indulge in the glories of pure Classic architecture triumphed, that we ceased to have a native style of our own; and we lost it then not because we carved acanthus-leaves in our capitals, and made our shafts to taper, and copied the sections of Classic mouldings, but because we adopted the principles of Classic construction.

Now we, too, like our forefathers in the sixteenth century, have a choice of styles before us. Eclecticism is forced upon us. Unless we work like pedants we cannot help being influenced by other styles than Gothic, even if we make that the basis of our work. We must be bigots indeed if we refuse a noble and beautiful material because we find the rules for employing it to advantage are different from those that are proper to the stone we have been accustomed to. We should rather, as I said before, welcome it as an opportunity for a fresh departure, as a lever for lifting our modern work out of the groove of mere imitation of one style among the many from which we have to learn our lesson.

On our architecture externally the adoption of marble can have little effect. Our climate forbids its use. Even in Italy the conglomerate marbles and breccias become disintegrated by exposure to the weather, and in England it would be folly to use them out of doors. White statuary is with us scarcely more durable, and though that harder kind of Carrara which for some mysterious reason we are in the habit of calling Sicilian is more durable, it soon loses in the external air all the appearance of marble, and looks little, if at all, better than any other white stone. Coloured marbles, too, are of little use to us for external decoration, for their polish soon disappears, and with it their peculiar beauty, and they soon become less effective than many ordinary stones that are available for the same purpose, such as the red magnesian limestone of Mansfield, the grey Forest of Dean, the red sandstones of Bristol and other places, and the purple sandstones of St. David's, all of which have the advantage over marble of durability under exposure to an English climate. But in the interior of our buildings there is ample opportunity for the use of marble. It is, indeed, the only stone which is tolerable in positions where we must touch or brush against it. The passion of the earlier Gothic revival for showing honest building material within doors has fortunately run itself out; it was never warranted by the usage of the original style, and it was found practically inconvenient. Our stone chimney-pieces came off white on our clothes, grew smoky and could only be cleaned by rubbing or scraping away the material; our stone fenders became dirty, and people wore them away by putting their feet upon them. And in more important architectural features it was found more comfortable to come into contact with wood and plaster than with bare stone. To marble, however, none of these objections apply. It is perfectly cleanly and so hard that wear has little effect upon it within doors; and though in private dwellings its costliness must prevent any very large use of it, it need not exclude it altogether, while in public buildings nothing can be more appropriate or beautiful than marble for door-cases, isolated piers or pillars, staircases, balustrades, pavements, and in more important buildings linings of wall surfaces, and even the structural members of the architecture itself. Of its suitability to church architecture there is no need for me to speak, for one seldom enters a modern church without finding marble used somewhere, though not always with good taste and judgment, nor in the right place.

I can only now express my hope that the time I have occupied in directing your attention to this subject may not seem to you to have been entirely misspent. The subject has, perhaps, novelty to recommend it to your notice; for, largely as marble is now employed, there has, so far as I know, been but little attempt made to reduce the method of using it to any definite principles. We have rather dropped into the practice of employing it as we think best, without any general rules to guide us, and, consequently, we often employ it very absurdly and irrationally. It is time we began to consider the matter more scientifically, to apply to this new material those general principles of common sense and utility by which we admit all good art is governed, and thereby to arrive at some general rules by obeying which we may avoid mistakes for the future.

If the statement I have to-night made of the conclusions to which my own observation has led me will help to direct your attention to the necessity of using marble more scientifically, and less empirically, it will not have been useless. It will, at all events, I hope, have the effect of inducing other gentlemen here present to give expression to their own views and opinions upon this subject, which is one of great importance to all who study or profess architecture.

In the discussion that ensued,

The Chairman (Mr. Ernest C. Lee, president) said he largely agreed with Mr. Jackson in the view which had been taken in the paper as to the proper treatment of marble work in architecture, and as to the treatment to which it was unfortunately too often subject in this country. Mr. Jackson had spoken of marble as a "building material" in Italy; possibly he (the chairman) might be hypercritical in interposing the remark that marble was a building material in Italy only to a limited extent; for brick and stone rubble, but more commonly brick, were the real building materials used, marble being principally used as a casing or veneer on the surface. He agreed with Mr. Jackson in condemning the use of figured alabaster and marbles in positions and as part of features for which the material was unsuitable, but in such cases the architect was very often as much sinned against as sinning. He might see and choose a block of alabaster or marble apparently devoid of pronounced markings, which would only show themselves when the block was cut deeply into. There was a good deal of deeply-cut marble work in Italy. As notable specimens he might mention the capitals of the Doge's Palace at Venice, particularly those representing the Drunkenness of Noah and the Judgment of Solomon. There was, too, a good deal of playfulness to be found in Italian carving. In the carvings of the west front of Orvieto this quality was quite as apparent as at Chartres. In our own country a great deal of the carving in hard stone was characterised by great freedom. He did not think that the absence of such freedom was so much the fault of the material as Mr. Jackson seemed to think, for we saw that in Northern countries the native humour would make itself apparent even in the hardest of materials, as, for instance, in the granite work of Cornwall. Mr. Jackson had recommended that mouldings should not be worked in figured marbles. He would also, probably, agree in saying that it was hardly advisable to put other than figured marbles into panels.

Mr. Stannus moved a vote of thanks to Mr. Jackson for his paper, which, he said, was full of suggestion and interest.

Mr. S. Flint Clarkson, in seconding the motion, said that the subject had been most lucidly treated by Mr. Jackson.

The vote of thanks having been carried by acclamation,

Mr. Jackson, in reply, said that when he spoke of marble as being a building material in Italy, he had in his mind the fact that in that country marble was used not only as a material for casing or facing, but for structural features such as doors, &c. As to the deeply-cut work in the marble capitals at the Ducal Palace at Venice, such deeply-cut work was, he thought, confined to the figure subjects.

The last meeting of the Association for the present session takes place this (Friday) evening, the 10th, when Mr. R. Corbett will read a paper on "Colour Decoration as applied to Architecture, from a Painter's point of view."

OAKFIELD GRANGE, SEVENOAKS.

THE accompanying drawings illustrate a house built on part of the Keppington Estate, Sevenoaks, called Oakfield Grange. The site chosen for the house and gardens is a wood with a meadow adjoining, containing together rather more than twelve acres of land, having many fine oak and other trees. The house is approached by a wide, winding carriage-drive through the wood, with grass on both sides running back into recessed banks of evergreen shrubs. The trees have been judiciously thinned; the old stumps and roots have been nicely built up for ferns, alpine plants, and climbers.

The house is built of Kentish rag stone, with Bath stone dressings and tiled roof, and harmonises well with the green trees that surround it. Mr. John M. Hooker is the architect, and the whole has been executed under his personal superintendence.

SELWYN COLLEGE, CAMBRIDGE.

This college, the first stone of which was laid at Cambridge on the 1st inst. by the Earl of Powis, High Steward of the university, is being built as a memorial to George Augustus Selwyn, Bishop of New Zealand and late Bishop of Lichfield.

When complete, it will contain rooms for 120 undergraduates, rooms for fellows and tutors, a master's lodge, chapel, hall, lecture-rooms, and library, with reading-rooms and common rooms. Besides the usual offices, there will also be accommodation for all the college servants, as well as storerooms, and cellars for wines, groceries, &c., which will be supplied to the undergaduates within the walls of the college.

The block of building shown in the view is the only part now in course of erection; the remainder, owing to lack of funds, cannot be carried out at present; and what further buildings are necessary will have to be of a temporary character.

The college faces westward in Grange-road.

The present block will ultimately form the west or entrance side of the quadrangle. It contains rooms for sixty-four undergraduates, with an entrance gateway in the centre, in which is the porter's lodge, and over the gateway two sets of tutors' rooms. The quadrangle, when complete, will have on the north and part of the east side the remaining undergraduates' rooms. The rest of the east side will be occupied by the chapel, library, lecture-rooms, and tutors' rooms. On the south side will stand the master's lodge, the hall, with the kitchen underneath, the common rooms, bursar's office and stores, and the servants' quarters behind.

The buildings are all of red brick, with Ancaster stone dressings.

The contract for the first block is 14,000*l.*, and has been taken by Messrs. Horsman, of Wolverhampton. Mr. Browning is clerk of the works. Mr. Arthur W. Blomfield, M.A., is the architect.

We are led to believe some misconception exists as to what sort of college it is to be. Some people think from the name that it is to be a missionary college; but this is not so. It is to be distinctly a Church of England college, but will receive undergraduates exactly like the other colleges, whatever their profession is going to be. The distinctive feature in it will be that it will offer a more economical scale of living than is at present possible in other colleges at Cambridge.

Stephenson Centenary.—Mr. T. P. Chapman sends us a medal he has designed and executed for this occasion. It is to be sold for a few pence,—its full value. Surely something better should have been done.

GREECE

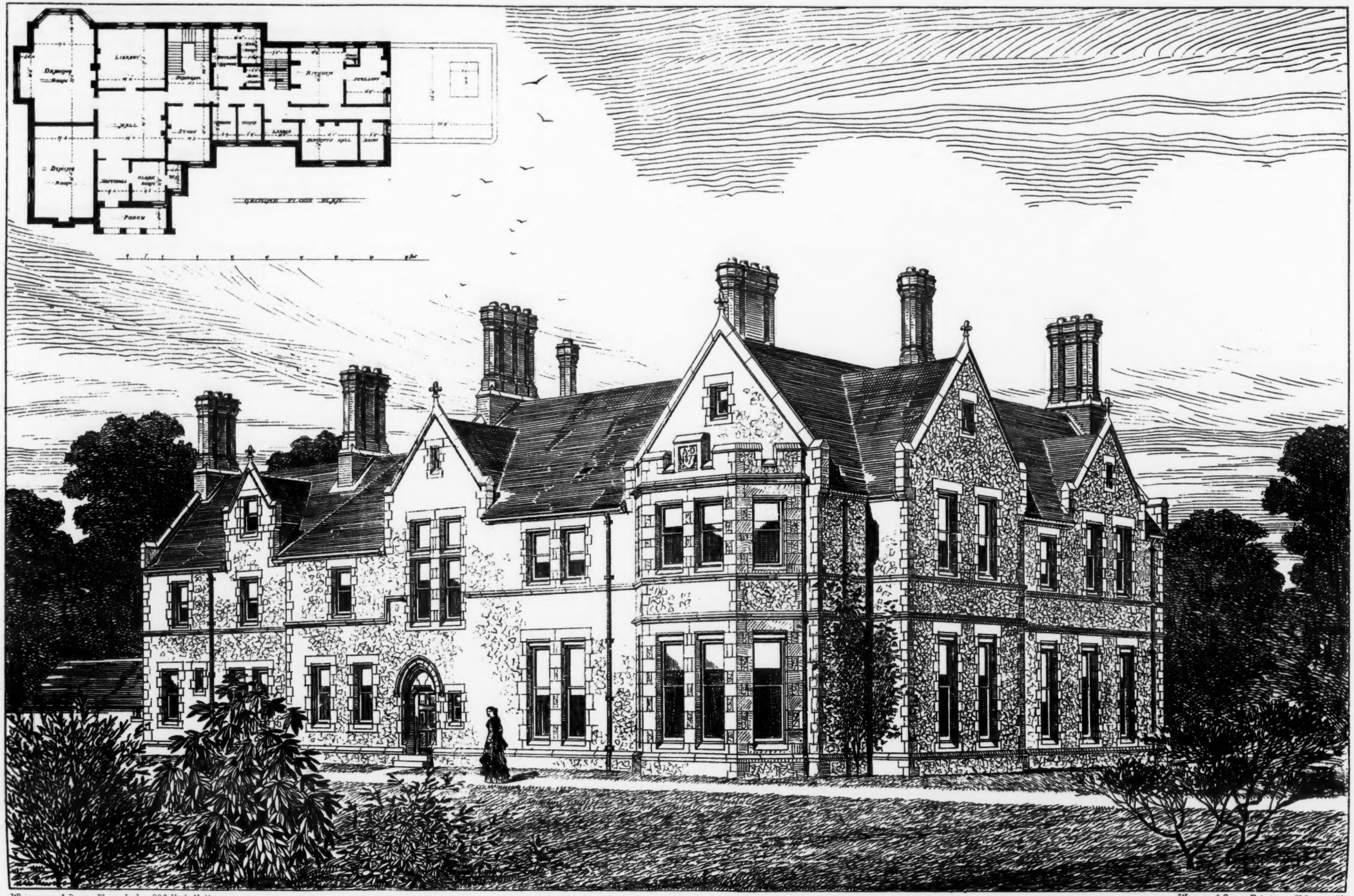
ROME.

SCULPTURE AND ARCHITECTURE: STATUES AT T

ITALY.

SPAIN.

TUES AT THE NEW PICTURE GALLERY, KASSEL.



Whiteman & Bass, *Photo-Litho* 236, High Holborn.

OAKFIELD GRANGE, SEVENOAKS, KENT.—MR. JOHN M. HOOKER, ARCHITECT.

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OAKFIELD GRANGE, SEVENOAKS, KENT.—MR. JOHN M. HOOKER, ARCHITECT.

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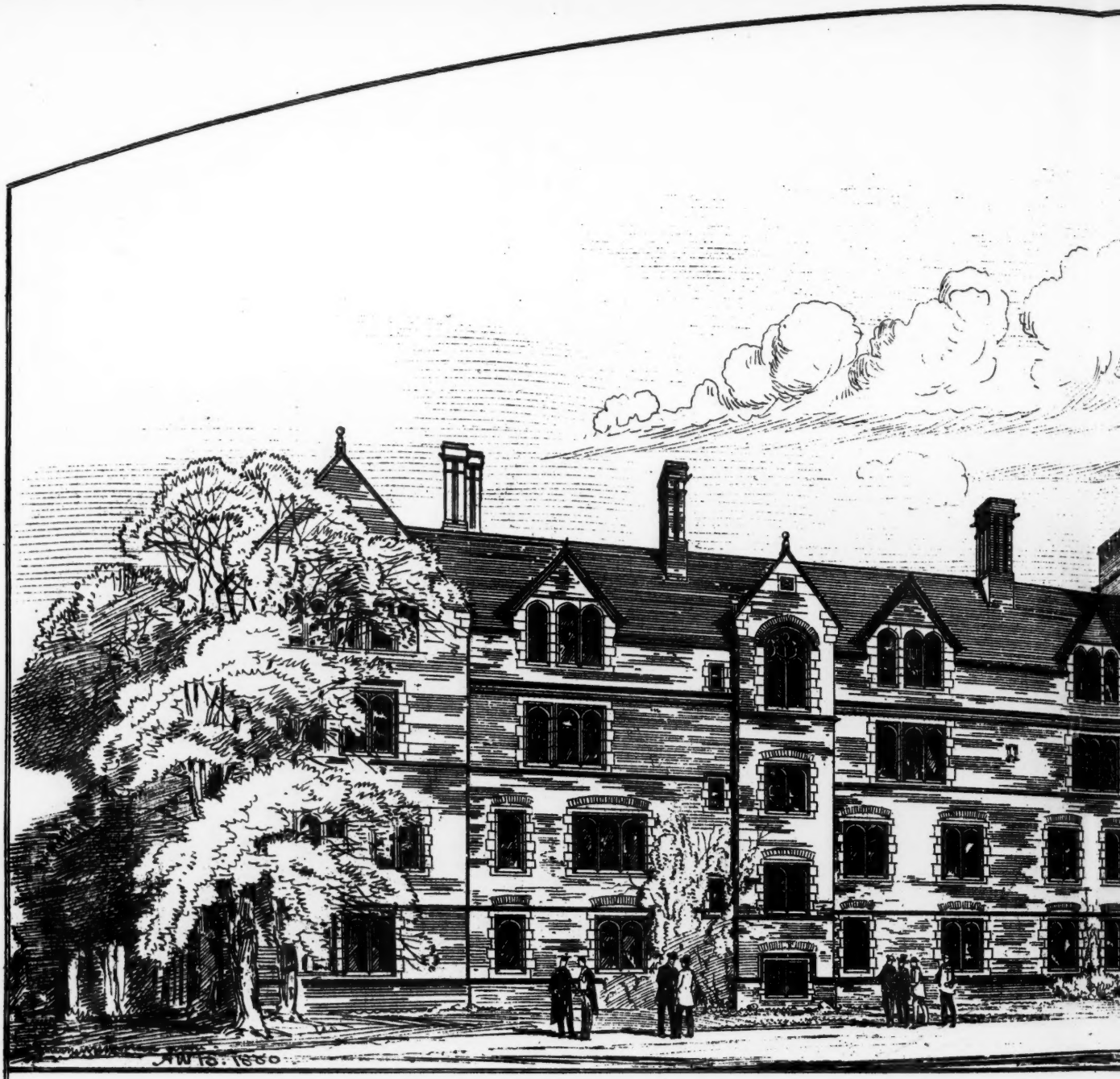
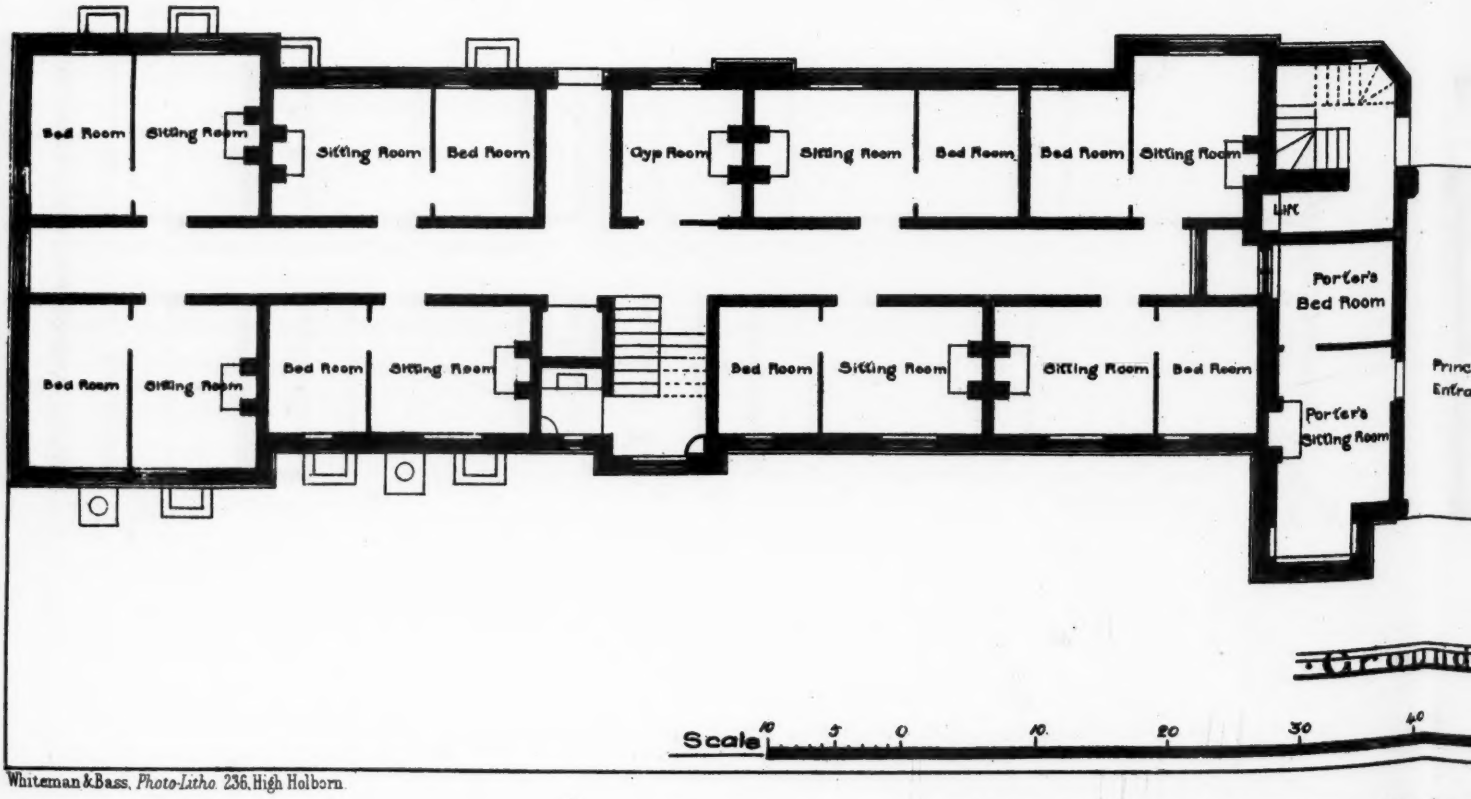
OAKFIELD GRANGE, SEVENOAKS.—ENTRANCE FRONT.





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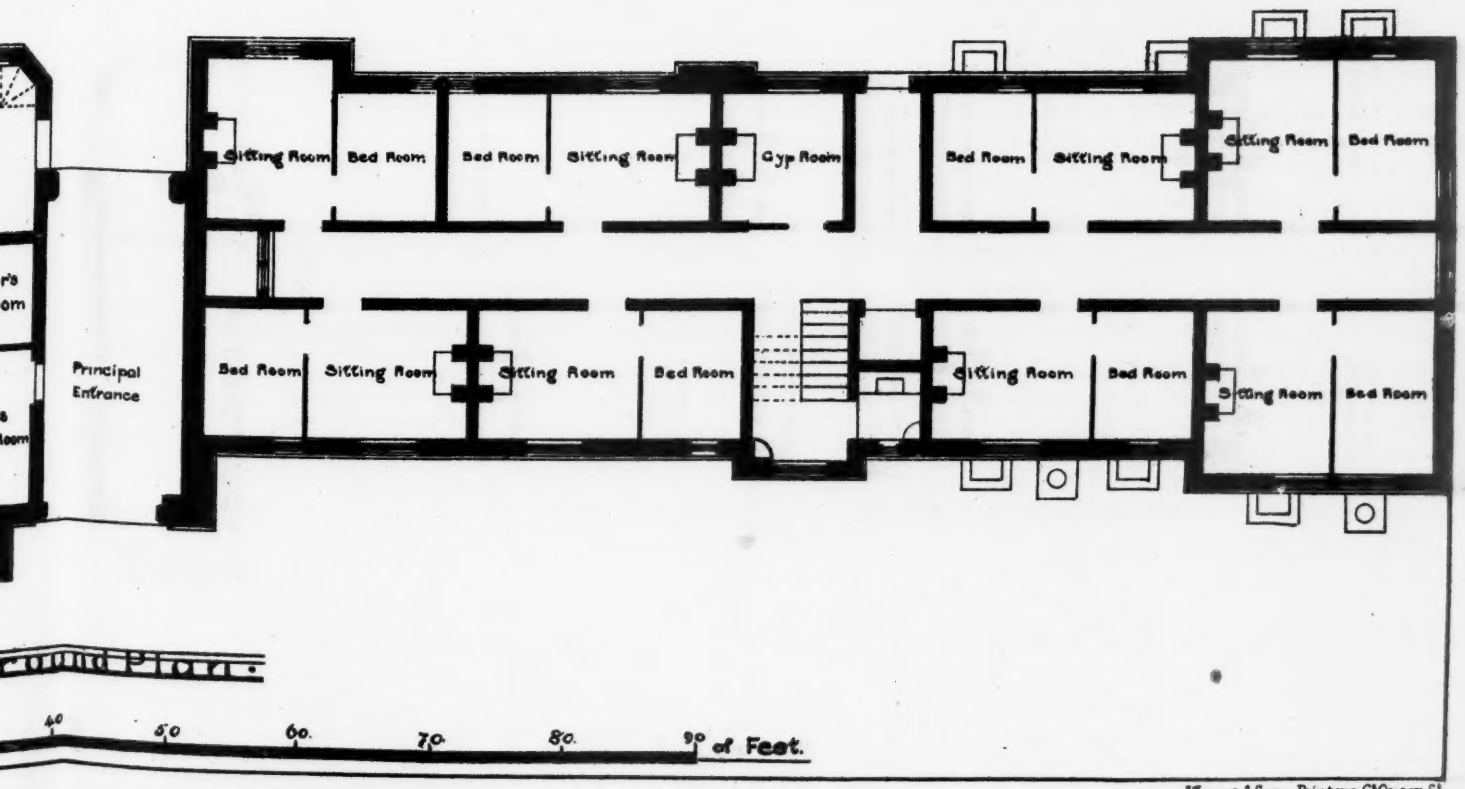
SELWYN COLLEGE, CAMBRIDGE.—Mr. Arte



—Mr. Arthur W. Blomfield, M.A., Architect.

Wyman & Sons, Printers, Gt Queen St.

SCULPTURE AND ARCHITECTURE.

THE NEW PICTURE GALLERY, KASSEL, GERMANY.

THE celebrated Kassel collection, once sadly despoiled by Napoleon I. (in consequence of which act it was deprived for ever of a valuable portion, which later went to Russia), and in Electoral times closed to the public, was resuscitated when it was removed from the dingy rooms it originally occupied to the handsome new building prepared for it. The site of this edifice, erected from the plans of Baurath von Dehn-Rotfelser, is in the best street of the town, in the so-called Bellevue, which, lined with houses only on one side, affords a splendid view from the eminence on which they are built over the green foliage of the Anepark, and beyond the latter as far as the mountains which bound the horizon. The south front of the new building has a loggia in the first story, from which elevation the charming view may be enjoyed. The edifice is in the Roman Renaissance style, the material being a reddish sandstone. It consists of a central portion and two corner pavilions. The latter are surmounted by flat pediments, the tympana of which are filled with youthful figures in lighter sandstone, representing history, *genre*, animal, and landscape painting, architecture, and sculpture. In the pediment over the portal in the eastern pavilion is the portrait of the founder of the gallery, William VIII., surrounded by genii. At both sides of the large central window over the entrance are niches containing the figures of Rembrandt and Rubens, the two masters to whom the gallery is indebted for its world-wide fame. All this sculpture is the work of Professor Hassenpflug.

The interior of the building is in keeping with its object. On entering the vestibule, a view is obtained up the staircase of dark grey Nassau marble to the entrance of the first room. On each side of the vestibule is a similar hall, divided from the former by two Doric columns of dark grey marble. The stairs are lighted from above, and the effect of this arrangement, the light striking down upon eight marble statues placed upon the balustrade, is admirable. These statues, by Karl Echtermeyer (four of which we illustrate), represent Greece, Rome, Italy, Spain, Germany, the Netherlands, France, and England. In the case of Greece, the sculptor has followed strictly the rules of the Greek classic, while in that of Rome he has proceeded more realistically, inserting the pupil of the eye, and otherwise adopting a freer treatment, imitating the Roman manner. The mediæval figures such as Italy, Spain, Germany, Netherlands, France, and England, the sculptor has conceived in a Romantic sense, and makes the last three entirely realistic. Italy has the pontifical staff in her right, an allusion to the great influence of the Church in the most flourishing period of art in Italy. The same sentiment is expressed in the case of Spain by the rosary and cross round the neck. Germany is portrayed by a modest maiden in the costume of the age of Albrecht Dürer. The Netherlands are given in the form of a wealthy burgher's wife in rich satin dress, similar to Van Dyck's representations, holding a palette and brush, the sculptor thus reminding us of the excellence of colouring of the Netherlands and the introduction of oil-painting there. France is a figure robed in a flowing royal mantle of fleur-de-lys, full of proud self-confidence, and wearing a laurel wreath. England,—which in the eyes of foreigners has no independent art epoch of its own, but which has deserved well of modern art by its splendid art collections and the publication of standard works on art,—the sculptor represents as leaning in pensive attitude on a broken obelisk, the right foot resting on a Greek capital, and holding in the left hand a book with the inscription, "Archäologie."

Prepared thus for the artistic enjoyment which awaits him, the visitor enters the four rooms of the central portion, all lighted from above, the open doors of which at once permit a view of the jewel of the Kassel Gallery, in the last room, the portrait of the Marquis de Guasto, by Titian. The arrangement of the light originated with the late Professor Magnus, and serves to demonstrate the correctness of the principles upon which he proceeded. Only the Antwerp Gallery is equal to that of Kassel in the happy distribution of light. The arrangement of the paintings according to schools is effected in such a manner that in the three skylighted rooms of the central portion, and the three adjoining cabinets with north light, the paintings of the most flourishing period of the Dutch school are placed; those of the oldest Dutch and the German schools being arranged in the rooms of the eastern pavilion, and those of the Italian school and the schools most nearly related to it in the western pavilion with its skylight room (the fourth of the whole series). The style of the decoration of the rooms corresponds with their contents.

The spacious rooms of the Kassel Gallery afford ample scope for a proper display of the pictures which it contains; and it may be said that the whole makes the impression of a richly and harmoniously adorned private palatial residence rather than of a picture gallery erected on purpose.

MONUMENTS.

WHEN "friends are lapped in lead," the provision of a fitting monument is usually one of the first cares of the survivors. Their motives for this tribute are mixed, as human motives are wont to be; and obedience to a respectable conventionalism, or a desire to give the deceased a *quid pro quo* for his handsome legacies, have often as large a place in them as respect or an honest enthusiasm to keep green the memory of the defunct. If people are millionaires, can draw upon the funds of a generous subscription, or have the public purse-strings loosened for them, they call in the services of the Roubiliac of the day, or of the esteemed architect whom every one applauds; but if they are ordinary folk, they go to a shop for their monument, and content themselves with a tradesman instead of an artist. The cemetery stone-mason is a thriving shop-keeper, and has his patterns, just as his neighbour, the tailor, has. He follows the shifting tendencies of art at a respectful distance, and his clients are, as a rule, willing to fall in with the prevailing fashion in stonework as enunciated by him. They select what he recommends as "quite the latest thing," or, at any rate, do not exercise their independence further than to choose one of those perennial designs whose crude symbolism has such hold upon a certain order of minds. Of these stock-pieces the stone-mason has generally a number on hand, graduated to suit the pockets of his customers.

Whilst 5*l.* is perhaps the lowest sum for which a monument can be erected, the prices of some of the more imposing ones would astonish any one not acquainted with the costliness of this kind of work. As much as 7,000*l.* or 8,000*l.* is said to have been paid for some of the larger monuments in Kensal-green. If we consider only the cost of materials before skilled labour is bestowed upon them, polished granite is, perhaps, the most expensive of all. This fine stone is almost always shaped and polished in Scotland, where masons work at a cheaper rate, and the necessary machinery is on the spot. So dear is this process of polishing granite, that its cost often exceeds the value of the raw material operated upon. The pure white marbles of Carrara, hewn from the sides of the most picturesque of European mountains, rank next in point of price. When employed in cemetery work, they are not polished, since the nitric acid used for that purpose so impairs their surface that it perishes when exposed to the open air for any length of time. Portland stone, of which so many of our public edifices are built, is cheaper, and wears very well, and is consequently in considerable demand for headstones. But when laid upon or near the ground, it is apt to become disfigured by delicate vegetable growths. This liability to discoloration it has in common with the free-grained friable stones such as those of Caen and Bath, which are unsuitable for monumental purposes. Only the finer and harder stones, and York stones, so much in request for pavements, are exempt from this failing. Hence it is that York stone, in slabs of from 5 in. to 8 in. thick, so frequently forms the foundation of a monument. Although many stones harden a little by exposure under ordinary conditions of climate, yet the atmosphere of London, as compared with that of rural districts, has a marked tendency to decay and deteriorate them. When this is attempted to be counteracted by the use of paint, if the stones be wet, or even damp, when the paint is applied, it is almost certain to come off, and leave them in a shabbier state than they were in at first. A material having been chosen and rough-hewn to the desired shape, if it is to be ornamented or to have figures upon it, the aid of the stone-carver or sculptor must be invoked. He will generally be found to work from a drawing, not extemporising or elaborating his own fancies into "frozen music," as the cathedral masons of old were wont to do. Portland stone is principally carved by Englishmen, but a great deal of marble work is done abroad, whilst granite is dealt with by the canny Scot "at hame." Of late years there has been a considerable importation of "ready-made" monuments into this country from Italy. Many of the best stone-carvers at work here are Italians, and the most expert amongst the English ones have studied in Italy. It would not be difficult to explain why Italians were brought over to sculpture the tombs of Henry III. and Henry VII., but at present the phenomenon of the employment of foreign stone-carvers to execute works comparatively simple may, perhaps, point to some deficiencies in our art and technical schools. Since a monument without an inscription would be simply an enigma in stone, the services of the letter-cutter or engraver are next enlisted. Elaborate epitaphs do not seem in accordance with modern taste, and the melancholy record, even in the case of the most distinguished persons, is now mostly confined to a bald statement of the name and years of the departed. The "shapeless sculptures" of Gray are still common, but the day of "uncouth rhymes" is nearly over. Inscriptions and designs have now to be submitted to the clergyman of the parish or the authorities of the cemetery, and though a mirth-provoking piece of statuary often passes the official censors, any verse or prose that might provoke a smile by its rugged originality or unconscious humour is sternly rejected. Yet, in spite of all this care, the letter-cutter will occasionally make a mistake, and impart a jocular flavour to an entire inscription that is as much out of place as the parenthetical "laughter" in the report of a trial for murder. Letters are chiselled or engraved in ordinary stone, and are then blacked with oil paint, by means of which any slight inaccuracies in their execution can be corrected. But this process of painting is not adapted for marble; paint will not sink into a material so little porous, and soon peels off. Granite has to be very carefully worked, since it is very apt to crack and crumble. The letters cut in it are then usually gilded. The more expensive method of lead-lettering is recommended by its durability. The letters being cut to the requisite depth, several small holes are made at the bottom of each of them. Each hole is directed at a different angle to the surface of the stone, and when the lead has been hammered in the letters are secured from the possibility of falling out. Lead is not poured in in its molten state, but hammered in cold, as any great degree of heat would burn and injure the enveloping substance. Brass letters are rarely employed, and are fixed to the stone by a mode of "plugging" somewhat similar to that just described. The character used should, of course, be in harmony with the monument, Old English or German text going with the Gothic style, and Latin with the Classical. The letter-cutter, who is paid at uniform rates per letter, including capitals, charges, as is but just, on a much higher scale for the more complex detail of the first-named characters. The monument being finished, the jacks, the levers, and the rollers that are to move it may not have to be called into action for some time after interment. A space of from three to six months must be allowed for the ground to settle. Despite this precaution, the fall of a monument is by no means an unknown accident, and this contingency is perhaps the *raison d'être* of a common regulation, limiting their weight when not upon the solid substructure of a brick vault. At last the task is completed, and the new memorial shines in short-lived purity amongst its dusky neighbours. Then comes the "dreadful reckoning." The stonemason has not many bad debts, but he is often troubled with entreaties to reduce in size or to abandon some half-finished monument ordered before the first excess of grief had passed away. If he cannot grant these petitions, let us hope he takes to heart the wholesome moral they point.

Looking around at the productions of the cemetery-mason, one is struck by the large preponderance of crosses. It is not many years since these were only to be seen above the graves of Roman Catholics. Now they are fashioned by hundreds, and in endless variety,—Greek, Maltese, floral, plain, rusticated,—ornamented with scrolls and adorned with doves. Obelisks and sarcophagi are favoured by the

wealthy, and the draped urn has survived the keen shafts of satire so often directed at it. The broken column and the weeping willow are apparently out of fashion, and have been supplanted by figures of Faith and Hope, bearing appropriate emblems. A few monuments here and there are cleverly designed and skilfully executed, but good and bad are equally lost in the crowded confusion of a metropolitan cemetery. On the whole, this branch of art does not appear to have profited much by the loud and constant teachings of those who have superintended the new Renaissance.

WEDMORE CHURCH, SOMERSET.

THE fine and interesting Church of Wedmore, Somerset, was re-opened on June 1st, amid great rejoicing, the occasion being observed as a public holiday, a very large assemblage of people from a distance being present. As the remains of King Alfred the Great's Palace were recently found in the parish (the excavations having been zealously prosecuted by the vicar, the Rev. Sydenham H. A. Hervey), and the celebrated Peace of Wedmore was signed here after the defeat of Guthlac the Dane, the associations of the place, independently of its fine church, are attractive. Originally a simple aisleless cruciform church, built at the end of the twelfth and commencement of the thirteenth centuries, extensive enlargements and alterations to it were made during the Perpendicular period. There are two large chantry chapels on each side of the chancel, and another one between the south transept and the porch; also aisles to the nave. In the north chantry roof an interesting Mediæval representation of the *Te Deum* remains. Over the porch are two rooms, *i.e.*, one above the other, forming a double-storied parvise, and externally having a striking effect, giving the appearance of a small tower. These rooms are generally considered to have been occupied by the priests to the chantries. During the last twelve months extensive reparations to the fabric of the church have been in progress, while the interior has been entirely re-arranged and new floors and fittings put in, all the windows reglazed, besides many other works. Some remarkable discoveries have been made; for example, a beautiful doorway with traceried windows on each side on the east side of the porch, between that and the "old chapel," as it is called (a chantry),—a most unexpected discovery. Behind the panelling under the sounding-board of the old Jacobean pulpit (the latter has been refixed on a low Ham Hill stone base) a tempera painting of St. Christopher was found, which consisted of no fewer than three paintings one over another, portions of which have been able to be preserved so as to make almost a complete whole. A preservation process was applied by Messrs. Lavers & Co., of London, by direction of the architect, as the exposure to the air was rapidly destroying the painting. The old rood-stair turret-door, the remains of a clear-story to the chancel, and the drip showing where the old Early English roof of the chancel existed, have also been found.

Although the walls of the church were in a fine condition, they were coated with rough-cast, which has been removed, opening to view the pleasing colour and texture of the Wedmore stone. The Perpendicular windows and the south Early English doorway have been repaired where necessary, and a good deal done to the porch and parvise,—*i. e.*, new floors of oak, handsome moulded oak ceiling, and a new roof, and tracery to the windows. The roofs to the south aisle and the various chantry chapels have been strengthened and scarfed as necessary, and a new leaden roof put to the north aisle. All the walls internally have been cleansed of white-wash and yellow ochre, and rough stuccoed. The modern pewing and west gallery have been removed, and the entire church reseated with English oak open benches, with thick moulded solid square ends. The choir-seats have been arranged under the central tower, and are also of English oak, but of a richer design. The church has been repaved with the old stone as far as possible, and new Keinton paving to match added. Many other minor works of reparation have been effected which it is needless to specify. Beyond re-plastering and new floors and the restoration of the south window, nothing further has been effected to the chancel. The latter work was done by the Ecclesiastical Commissioners, under the direction of their architect, Mr. Christian. A Portland cement floor has been laid in the north transept, where the organ, rebuilt by Mr. Willis, is put. All the windows (except to the chancel) have been reglazed with cathedral rolled glass and clear white glass, in ornamental patterns of varied design, some old diaper quarries being re-used. The old stanchions and saddlebars have been retained. The ground externally has been lowered, and the drainage of the churchyard improved. Two of Porritt's underground stoves have been put in different parts of the church. The tower parapet has been strengthened at the angles, and the flat relaid with lead, and a better system of carrying off the water contrived. The bells have also been rehung.

These works to the body of the church have been carried out, under the superintendence of Mr. Edmund B. Ferrey, by the builders, Messrs. Fredk. Merrick & Son, of Glastonbury, who were also the contractors for the work to the chancel.

CO-OPERATION AND THE WAGES QUESTION.

ON Monday last the thirteenth annual congress of delegates from co-operative societies in Great Britain and Ireland was opened in Leeds, when

Lord Derby delivered an address, in the course of which he said,—What I understand to be your distinctive principle is this, that the worker should be paid according to the results of the work; that he should be wholly or in part his own employer. Now, what an outsider or casual inquirer would naturally ask about that principle is, how does it act as regards quantity and quality of industrial production? How does it affect the happiness and comfort of those who adopt it? And how does it bear on the relations between labour and capital? These three, I think, are the main heads of our inquiry. As to the first, it must strike any impartial observer that more work is likely to be done, and that it is likely to be better done, on the co-operative system than on that of ordinary wages, and for a very simple reason. In the former case every man is working for himself,—for others also, no doubt, but among others for himself; in the latter case he is working for an employer with whose interest he cannot be expected to identify himself very warmly. In co-operative industry the master's eye is everywhere. I have heard it affirmed, —whether truly or not I cannot judge,—that in occupations where men are hired by the day, it is an unpopular thing for any one to do more than his mates, and that the exhibition of more than ordinary industry and skill is likely to be resented rather than imitated and admired. But introduce co-operation, and every working man is an employer and an overlooker too. The master's eye is literally everywhere. Slow work or scamped work means so much less return to the associated body, and those who are working together have the strongest possible interest, not only in doing their own appointed task, but in seeing that everybody else does his. Then as to the effect on the workman himself. It is a commonplace to say that labour in which we take a keen interest almost ceases to be labour at all, and that a very light task performed on compulsion and as mere drudgery is felt to be heavy. And if, at the same time, the worker knows that in every stroke of work he is helping his own comrades, not pulling against them; that the more he does the more he earns their goodwill, and not their envy or jealousy; and if, further, he has reason to suppose that, in however subordinate a capacity, he is helping on a movement which is for the permanent benefit of his country, he has motives to impel and feelings to encourage him which the ordinary labourer has not, and which may very well carry him over difficulties and discomforts such as are incident to every form of employment. It is sometimes objected, "Division of profits is very well where there are profits to divide; but how if there are no profits, only losses?" Well, to that I answer, "Supposing a private business, be it a mill or a shop or anything else, collapses in consequence of bad times, is the man who works in it for wages free from the results of failure?" No; he loses his employment, and in a dull state of trade he may not, possibly, find another. The utmost that he gains is that his wages may be kept on a little longer while the employer is slowly consuming his capital; and if a co-operative undertaking, no matter what, be worked with skill and care, it ought to be able to command as much capital to meet a temporary emergency as a similar undertaking in private hands. My third point is that of all the ten thousand schemes hitherto proposed,—and there is a new one about every six weeks,—for closing the long-standing differences between labour and capital, co-operation is that which promises the largest results with the fewest drawbacks. I will not occupy time by speaking of what we all know; the waste of capital and the waste of labour (which is the same thing), the ill-feeling, the bitterness, which trade disputes carry with them. In such disputes we feel that the result is lamentable, yet we hardly know whom to blame. Is the capitalist wrong in refusing to pay higher wages than the market price? Certainly not. He is not bound to do it, and if he did, his neighbour who has fewer benevolent impulses or scruples would undersell him. Is the working man wrong in trying to get the best price he can for his labour, and in combining with others for the purpose? Certainly not. It is both his natural and his legal right. Yet, both being in the right, millions of money are squandered, social feuds are created, sometimes riot and disturbance follow. Where there is on both sides a wish to discover reasonable terms of peace the intervention of an impartial third party who shall hear both sides and decide is often effectual in bringing about an understanding. But arbitration is not always an applicable remedy; in fact, it is a remedy which can only be applied when the disease is in a fair way to be cured. Two parties to a dispute who both agree to refer it to an umpire are already half-way to an understanding; but when each is convinced of being in the right and quite convinced that the other is unreasonable, what chance is there of their consenting to refer the matter? And let me add that in labour questions, so far as my experience goes, arbitration is never a wholly satisfactory process. I have sat more than once as umpire, and never without a feeling that I was asked to pronounce a judicial decision in a matter in which really there is no law to appeal to. There is usually not much doubt as to the facts. The question whether or not such and such a payment for labour is a fair one is in its nature insoluble. You cannot untie the knot; you have to cut it, and when it is cut, when the strike is over and work begins again, though the dispute is settled for a moment, the cause of it remains, the dormant antagonism of interests is not removed. You co-operators meet that difficulty, or rather, you turn it. You say, "There shall be no conflict of interests where we are concerned, for two parties shall be identical; the employer shall be also the employed, and the profits of one the gain of the other." It is, if I may use such an expression, like the settlement of an old family law-suit by the marriage of litigants. It ends the dispute because there is nothing left to dispute about, and what a dispute it is to end!

NEW HALL AT THE ORPHAN WORKING SCHOOL.

THE memorial-stone of a new hall which is about to be erected in connexion with the Orphan Working School at Haverstock-hill was laid last week by Mr. Charles Tyler, brother of Sir James Tyler, at whose cost the building will be erected. The architect, Mr. Charles Bell, exhibited the plans during the stone-laying ceremony, and stated that the architectural character of the structure would be a free treatment of the Italian style. The building will be in shape a parallelogram of 40 ft. by 69 ft., this being necessary owing to the character of the ground. He explained that there would be separate entrances to the building for children and for visitors, and that space would be provided for a good-sized organ-chamber. The building will accommodate 900 persons, there being seating space for 500 visitors, in addition to that portion set apart for the children connected with the institution. The principal object in erecting the building is to provide accommodation for religious services, and also for public examinations and distribution of prizes to the children belonging to the school. The cost of the building will be 2,500*l*.

Mr. James Holliday, jun., of Loughborough Junction, is the contractor.

Melbourne Exhibition, 1881.—Messrs. J. Defries & Sons, of London, have been awarded a first prize medal for the manufacture of their crystal chandeliers.

THE BIRMINGHAM IMPROVEMENT SCHEME.

APPEAL AGAINST AWARD.

AT the Council House, Birmingham, on the 3rd inst., before Mr. R. C. Heath (Under-Sheriff for the county of Warwick) and a special jury, Mr. C. J. Fletcher appealed against the final award made by Sir Henry Hunt, C.B., the official arbitrator under the Birmingham Improvement Scheme, in respect of freehold properties situated in Newton-street, at the corner of Steelhouse-lane, and in Lichfield-street, and also in respect of disturbance to his trade as a machinery and tool broker, now carried on in parts of the properties mentioned.

In regard to the Lichfield-street property, which comprises 616 square yards of land containing some one-story shops and sheds, the valuers called on behalf of Mr. Fletcher estimated the land to be worth about 6*l.* a square yard; while the Corporation valuers estimated it at about 3*l.* a square yard. The Newton-street property comprises 1,980 square yards of land, covered with factories, shops, and dwelling-houses. On behalf of Mr. Fletcher it was estimated that the latter property was worth twenty years' purchase, and for the Corporation it was estimated by one valuer at seventeen and by two others at eighteen years' purchase.

Mr. Fletcher's witnesses and the values placed by them upon the properties were as follow:—Mr. W. Fowler (of Messrs. Fowler & Sons), 3,750*l.*, in respect of Lichfield-street property, and 10,900*l.* in respect of the Newton-street property—total, 14,650*l.*; Mr. Thomson Plevins, 3,438*l.* and 11,035*l.* respectively,—total, 14,473*l.*; Mr. W. Gibson (of Messrs. Chesshire & Gibson), 3,746*l.* and 11,215*l.*,—total, 14,961*l.*; and Mr. J. Roderick (of Messrs. Roderick & Son), 3,388*l.* and 11,035*l.*,—total, 14,423*l.*

The valuations on behalf of the Corporation were as follow:—Mr. W. Harris, 1,848*l.* and 7,600*l.*,—total, 9,448*l.*; Mr. T. S. Fallows, 1,848*l.* and 7,674*l.*,—total, 9,522*l.*; and Mr. E. Ryde (of London), 1,80.*l.* and 7,310*l.*,—total, 9,110*l.*

On behalf of Mr. Fletcher, compensation was also claimed for trade disturbance and for removal and depreciation of stock.

The jury awarded 13,250*l.* as the value of the two properties and for expenses incurred in removal of stock, and 600*l.* for goodwill, loss, or disturbance of trade, making a total of 13,850*l.*

The amount of the arbitrator's award, against which Mr. Fletcher appealed, was 12,500*l.*, and the Corporation will consequently have to bear the costs of the appeal.

A LARGE RESERVOIR FOR BIRMINGHAM.

THE Birmingham Corporation are at present greatly extending their waterworks in connexion with the supply of the town, and on Saturday the first sod of a new storage reservoir was cut by Alderman Avery, the chairman of the water committee. When completed, this reservoir will be one of the largest of its kind in the country. It will cover an area of 90 acres, and will have a storage capacity of 400,000,000 gallons. In addition there will be a smaller reservoir, capable of holding 20,000,000 gallons, into which water from the river Bourne will flow. This smaller reservoir is for the purpose of providing for the subsidence of solid impurities before the water is allowed to pass into the larger reservoir. The estimated cost of the two reservoirs is 79,000*l.*, the engines, boilers, and buildings bringing up the entire cost to 125,000*l.*

COMPETITIONS.

Market Buildings, Birmingham.—At a meeting of the Birmingham Town Council, on Tuesday last, the Markets and Fairs Committee reported that they had completed the purchase from Mr. James Gilbert of his leasehold interest in the Woolpack Hotel, Jamaica-row. This acquisition having opened the way to a more important improvement than that approved by the Council in May, 1880, the committee invited three firms of architects to send in designs for the erection of the market buildings in St. Martin's-lane, including the new Woolpack Hotel, and their designs had been sent in for competition, and were now submitted to the Council. After careful consideration, the committee believed that the design and plans marked "En Avant" were the most suitable as market buildings and hotel for that site, and required the least modification to adapt them for all the purposes contemplated by the committee; they therefore recommended them to the Council for adoption, instead of the plans and elevations formerly submitted. These plans provided for hotel, with restaurant; shops, with offices over them; coffee-house and dining-room in Moat-lane; rooms suitable for superintendent's offices and residence; and a number of other rooms which could be attached to the hotel or to the coffee-house, or to the shops, as occasion and tenants might require. The elevation was to be constructed in red brick, with terra cotta and stone dressings. The estimated cost was 14,000*l.*; and the committee believed it could be carried out without diminishing the estimated profit to be derived from the market improvements. Mr. M. J. Hart moved the adoption of the plans for the new premises, but two-thirds of the Council not being present it was deferred, on the motion of the Mayor.

Birkenhead Town-hall.—At a meeting of the Birkenhead Town Council on the 1st inst., the General Purposes Committee recommended "That the portion of the resolution passed at the meeting of the committee on the 10th September, 1880, with reference to the accommodation required for Town-hall purposes, so far as the same refers to the sessions-accommodation, be rescinded." Also, "That the sum to be expended on the Town-hall shall not exceed 50,000*l.*;" and "That the borough-surveyor be instructed to prepare a lithograph plan of the site, and the dimensions thereof, and printed instructions to architects for the providing of the accommodation agreed upon, except the Sessions House," and "That premiums of 300*l.*, 200*l.*, and 100*l.* be offered for plans for the erection of the Town-hall and Municipal Offices on the Hamilton-street site." After some discussion the whole question was referred back.

Designs for "Posters," Liverpool.—At the meeting of the Library, Museum, and Arts Committee of the Liverpool City Council, on the 2nd inst., the committee had before them eighteen competitive designs for posters announcing the autumn exhibition of pictures. After due deliberation, three were set apart for final adjudication. They were the work of Messrs. W. P. Gray, lithographic artist, Cable-street; Robert Fowler, artist, South Castle-street; and John A. Metcalf, architect, Mayfields, Westminster-road. Ultimately, the choice of the committee for the prize of ten guineas fell upon Mr. W. P. Gray. It was also resolved that Mr. Fowler be offered the sum of ten guineas for the copyright of his design.

HAUNTED LONDON.

THE Council of the Society of Arts have just erected six new memorial tablets on houses which are of historic interest as having been occupied by celebrated men. The residence of an emperor, two statesmen, a philosopher, and two artists have been thus distinguished. These China plaques will now be found on the front of No. 15, Buckingham-street, Strand, where Peter the Great lived for a short time; on 25, Arlington-street, for many years the residence of the famous prime minister, Sir Robert Walpole; on No. 14, Savile-row, where Sheridan lived; on No. 35, St. Martin's-street, Leicester-square, for some time Sir Isaac Newton's home; on 36, Castle-street, Oxford-street, where James Barry, the painter, received the statesman, Burke; and on 30, Leicester-square, a new building occupied by Archbishop Tennison's School, which stands on the site of Hogarth's home.

In former years the Society of Arts have marked with their memorial tablets the homes inhabited by Burke, Byron, Canning, Dryden, Faraday, Flaxman, Franklin, Garrick, Handel, Johnson, Napoleon III., Nelson, Reynolds, and Mrs. Siddons.

In connexion with one of the houses now marked an observation occurs to us. At the bottom of Buckingham-street, Strand, and overlooking that interesting relic of the river-line of the now embanked Thames, Inigo Jones's Yorkgate, the Society of Arts has marked with one of their blue plaques the last house on the east side (No. 15) as having been once the residence of Peter the Great.

In the last house on the *west* side of the street lived the sprightly diarist, Samuel Pepys, and it was in this house, in the belief of a writer so familiar with London as Peter Cunningham, that Peter the Great resided.

The Parish Church at St. Ewe, near Mevagissy, contains the finest old rood-screen in Cornwall. It is made wholly of oak, carved, groined upon its eastern as well as its western side, and has a wide rood-loft on its top. Through the exertions of the Rev. A. Lawrence, the present rector, the church itself is being restored from the designs of Mr. James Pier St. Aubyn, of London; and under his direction the old screen is now being restored and lengthened by Mr. Harry Hems. St. Ewe Church is one of the few old churches in the West Country which can boast of a spire.

PATENT RECORD.*

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending May 28, 1881.

4,067. J. R. Pickard, Leeds. Closets and ashpits.

The ashpit is placed between two closets. The whole of the ashes fall on inclined grates, which allow the finer ashes to fall through on the excreta and deodorise it. The coarser ashes fall into a receptacle provided for them. October 6, 1880. Price 6d.

4,073. W. H. Saint-Aubin, Willenhall. Fastenings for carriage-doors, &c.

This is applicable also to other doors, sashes, &c. The lock consists of two main parts,—a striking bolt and a square-headed bolt. The striking bolt, which is bevelled each way, is carried on a vertical shank, working on a stud at the lower end of the case, and a little back from the fore-plate. A spring presses it forward. The tail end of the square-headed bolt projects downwards, and carries a stud which gears into a slot within the horn of the follower. This is also pressed forward by a spring, and is guided by a stud projecting through a slot formed in it. A part behind the head of the striking bolt is formed a convex curve, and a corresponding concave curve is formed on the underside of the square-headed bolt immediately behind the part which is shot forward through the fore-plate. October 7, 1880. Price 6d.

4,196. W. Love, Glasgow. Apparatus for heating and ventilating by oil or gas, &c.

Air is led to pass over extended and circuitous metallic surfaces, heated by gas or oil, encased in a stove or casing, and then delivered into the apartment to be heated. Several modifications are shown. Oct. 15, 1880. Price 6d.

4,246. C. Giuliano, Piccadilly. Ventilating, &c., buildings.

A shaft is erected from top to bottom of the building, in which may be ladders, as fire-escapes. There are doors in each story to this shaft, in which are ventilators. Above the roof a fan is placed, revolved by driving cords and weights, and a hood projects the air from the fan, horizontally *Pro. Pro.*) October 18, 1880. Price 2d.

4,251. J. H. Greathead, Westminster. Portable Hydrant.

This is a modification of patent No. 4,728, of 1878, to cases where there is no low-pressure main, but only water, as in a dock, &c. A pipe is fitted with three nozzles; one for the hose or suction-pipe, another to be connected to the nozzle of the high-pressure main, and the third for the ordinary fire-hose. Within the pipe the high-pressure branch terminates in an injector-nozzle, which draws up the water through the suction-pipe, and causes a proper discharge. Oct. 19, 1880. Price 6d.

4,284. P. Maclellan, Glasgow. Indiarubber matting, treads, cushions, &c.

The indiarubber has a series of flutes or interrupted corrugations formed in it, by slitting it in the desired patterns, and by mandrils forcing the solid rubber between the slits alternately upwards and downwards, and it is then vulcanised, whereby these flutings are rendered permanent. Oct. 21, 1880. Price 6d.

4,292. D. S. W. Dawe, Brading. Manufacture of Portland cement.

This is to convert fossil limestones and freshwater marl into cement. The materials are first dried, and then ground to a fine powder, which is afterwards submitted to a triturating process in a mill, and sufficient water added to permit the mass to be made into bricks. These, after being dried, are placed in a cement-kiln, and converted into a clinkered mass, which is then again ground into powder, and the cement is formed. Oct. 21, 1880. Price 2d.

4,337. W. R. Lake, Southampton-buildings. Circulating medium for heating apparatus.

Instead of water as the heating medium in pipes, &c., a solution of chloride of magnesium is used, which will not freeze and does not evaporate. (Com. by B. Bernhardi, Stassfurt, Germany.) (*Pro. Pro.*) Oct. 23, 1880. Price 2d.

SALES OF SUBURBAN BUILDING SITES.

A FEW evenings ago there was a large sale, at the Feathers Hotel, Ealing, of a number of freehold building sites, on the Castle Hill Park Estate, Ealing, the property of the British Land Company. Mr. W. H. Collier conducted the sale. The total number of sites offered was 150, the greater portion of which contained frontages of 20 ft., with a depth varying from 160 ft. to 220 ft. Of these, ninety plots were sold at prices ranging from 100*l.* to 120*l.* each. A corner plot having a frontage of 110 ft. to Kent Gardens, and 199 ft. to Victoria-road, realised 300*l.* Another plot having a frontage of 65 ft. to Castle Hill Park-road, and an average depth of 194 ft., fetched 320*l.*; and an angular plot, having a frontage of 154 ft. to Castle Hill Park-road, and an extreme depth of 144 ft., was sold for 250*l.* The aggregate proceeds of the sale amounted to 9,700*l.*

Messrs. Protheroe & Morris offered for sale, at the Angel Hotel, Ilford, seventy-one lots of freehold building land, forming the fourth portion of the Clements Estate, at Ilford, comprising an area of about 100 acres. Nearly the whole of the plots were sold, those having a frontage of 20 ft., and a depth of from 150 ft.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

to 160 ft. realising 65*l.* and 70*l.* each, whilst some larger plots fronting High-street, the main road, with frontages of 25 ft. and 28 ft. each, were sold at prices ranging from 135*l.* to 200*l.* each.

THE LONDON AND LANCASHIRE LIFE ASSURANCE COMPANY'S NEW BUILDINGS.

THE handsome new block of buildings in Cornhill, which has for some time past been in course of erection for the London and Lancashire Life Assurance Company, is now almost completed, and is expected to be occupied by the company in the course of a few weeks. The buildings have a frontage to Cornhill of about 55 ft., and are 65 ft. 6 in. in height, containing ground-floor and three lofty floors, with dormers. The base of the buildings is in grey granite, with double columns in the same material on each side of the entrance, and at the east and west sides of the elevation, carried up to a cornice at the foot of the first-floor windows. The rest of the frontage is in Portland stone. On each side of the entrance, which is 6 ft. 6 in. wide, there are fluted pilasters from which springs a carved arch, inclosing the arms of the company. Immediately above the ground-floor windows an enriched entablature is carried across the elevation. It is divided into panels, in the centre of each being richly-carved medallion figure-heads, with Cupids and festoons on each side. At the foot of the second-floor windows are the arms of the City of London, and also the arms of Lancashire, which have been adopted by the company. Each floor has a range of three three-light windows, with double columns between the first and second-floor windows, and fluted pilasters between those on the third floor. Above the third floor is a bold cornice, surmounted by dormers and finials. The whole of the ground-floor, containing an area of upwards of 54 ft. square, will be occupied as the business premises of the company, and will be richly decorated. A portion of the first floor will also be set apart as offices for the company's business, the other parts of the building being let for general commercial purposes.

The architect of the buildings is Mr. T. Chatfeild Clarke, and the contractors are Messrs. Colls & Sons. Mr. Mallcott has acted as clerk of the works. The estimated cost of the buildings is 16,000*l.*

"EVANS'S" AND THE FALSTAFF CLUB.

THE conversion of Evans's, Covent Garden, into what has been for some time spoken of as the "Falstaff Club," embracing the construction of a private theatre in a part of the premises, is not likely to be carried out. The proprietor of Evans's has just placed the property in the market, which is announced as for sale or to be let, and this is stated to be owing to the promoters of the intended club being, from some cause or other, unable to carry out the undertaking. It is belived, however, that the central situation of Evans's will shortly lead to a purchaser being found, with the view of its conversion into a club.

A Relic of Old London.—"About sixty years ago," writes a correspondent to *Notes and Queries* in 1857, "I was travelling from the West of England, and my fellow-travellers were an octogenarian clergyman and his daughter. In speaking of the then increasing size of London, the old gentleman said . . . I have myself seen a pump reputed to be erected on the Conduit Head, and standing against the corner house of a small turning out of Lamb's Conduit-street, on the right-hand side as you go towards the Foundling, and nearly at the upper end of the street." In this same small turning, now known as Long-yard, may be seen, on the gable of the first house on the left entering from Lamb's Conduit-street, indication of a recess, now bricked up, on the lintel of which is carved the inscription, nearly obliterated by successive coats of paint and dirt, "Lamb's Conduit, the property of the City of London. This pump is erected for the benefit of the public." Unfortunately, the date cannot be deciphered. Most probably the pump was placed here in 1746, when the Conduit, built in the reign of Henry VIII., and rebuilt in 1667, was removed. The existence of this relic is not mentioned in any modern guide or handbook of Old London.

ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETIES.

Lincoln Diocesan Architectural Society.—A programme has been issued showing the proceedings to be taken at the annual meeting of this society, which will be held at Sleaford on Wednesday and Thursday, the 15th and 16th inst. The architectural features of the parish church will be described by Mr. Charles Kirk, M.A., architect. A brief opportunity will then be afforded the members and friends to view the town, the site of the castle, &c., after which, at eleven o'clock, the carriages containing members and visitors will start from the Market-place on an excursion to the following places, viz., Kirkby Laythorpe, Asgarby, Heckington and Hale, Howell, South Kyme, Anwick, Haverholme, and Ewerby, returning to Sleaford at six p.m. On the second day the carriages will start from the Market-place at ten o'clock, for the following places, viz., Quarrington, Silk Willoughby, Swarby, Aunsby, Dembleby, Newton, Walcot, Folkingham, Billingborough, Horbling, Swaton, Helpringham, and Burton Pedwardine, reaching Sleaford again at six p.m. In the evening a meeting will be held in the Corn Exchange at eight o'clock, when papers will be read "On the Dedication of the Churches of Lincolnshire as illustrating the History of the County," by Mr. Thomas Kerslake and Precentor Venables; and on "Kyme and its Tower," by Mr. C. Kirk.

London and Middlesex Archæological Society.—The annual meeting of this society will be held at the Guildhall, on Wednesday, the 22nd inst., when the Lord Mayor is expected to preside. It is twenty-one years since this society held its meeting in the Guildhall, and an influential and large gathering is expected.

Cambridge Antiquarian Society.—The annual meeting of this society was held on the 30th ult., Professor Hughes, F.S.A., the retiring president, in the chair. The Rev. R. Burn, M.A., of Trinity College, was elected President for the ensuing year. The annual report mentioned the continuous growth of the society, which now numbers 224 members, and referred to the loss recently sustained by the deaths of Dr. Guest and of the Rev. S. Banks, M.A. The Treasurer reported that the society has a balance in hand of 262*l.* 10s. 8d., which is, however, fully required to meet the expense of the new editions of Dr. Raven's "Bells of Cambridgeshire," and of Professor Babington's work on "Ancient Cambridgeshire," and other books which will soon be issued to members.

CAREFUL CALCULATION.

SIR,—I beg to hand you a list of recent tenders, which I think may be a curiosity, even to one of your extensive experience, especially considering that quantities were supplied, and that the work was all of the simplest character.

R. A.

For the levelling, draining, and other works required in the preparation of the Southern Sewage Farm, in the district of Ripley, near Derby, area about 6½ acres, for the Ripley Local Board. Mr. R. Argile, surveyor. Quantities supplied:—

Hallam, Codnor	£2,152	15	3½ !
Beardsley & Pounder, Ilkeston	524	14	6
Breedon & Spencer, Wessington	491	0	0
Hawley, Ilkeston	486	10	0
Coupe, Ripley	466	0	0
Wain, Ripley (accepted)	360	3	6
Wem, Rodgers, & Wingad, Whittington (withdrawn)	242	19	11 !

NEW COLLEGE BUILDINGS.

Ely.—The dedication and opening of the new buildings of the Ely Theological College took place on the 31st ult. The college was founded by the present Bishop of Ely in 1876, 1876, and Canon Luckock was appointed the first principal. It is designed as a place of preparation for candidates for Holy Orders, and is open only to students who have graduated at one of the Universities. The permanent building was commenced in 1879 from designs by Mr. J. P. St. Aubyn, and the contract was taken by Messrs. Bardell Brothers, of Lynn. It contains chapel, lecture and dining hall, library, principal's and vice-principal's studies, and twelve sets of rooms for the students, besides the ordinary offices, &c. The style belongs to the Late Decorated period of architecture. The chapel is richly furnished, and the sanctuary has been decorated from designs by Mr. C. E. Kempe, who has also executed some stained glass for one of the windows. The east window, representing "Christ adored by the Angels and Church-workers in all Ages," is filled with stained glass by Messrs. Heaton, Butler, & Bayne.

Quinton.—On the 6th inst. the ceremony of laying the foundation-stones of the proposed Bourne College, connected with the Primitive Methodist body, at Quinton, took place. The college is intended for the training of the sons of ministers of the sect and of laymen. The building, when completed, will accommodate 120 scholars; that portion of it now in course of erection will accommodate eighty. Queen Anne style of architecture has been decided upon. The walls will have brick facings, with stone and brick dressings. The contractor is Mr. E. Walton, Smethwick, and the cost of the buildings will be 3,700*l.* Messrs. D. Smith & Son, Bennett's-hill, Birmingham, whose designs were selected in competition, are the architects.

NEW PARKS.

Wolverhampton.—On Whit Monday the Mayor of Wolverhampton formally opened the new public park for that town. Negotiations were entered into with the Duke of Cleveland for the purchase of a portion of the Broad Meadows, situated almost in the centre of the borough,—better known, perhaps, outside Wolverhampton as the site of the old racecourse. The result was that his grace agreed to let to the Corporation, on lease, with power to purchase at the end of sixty-three years for 20,000*l.*, a tract of fifty acres in the centre of the meadows, the annual payment to be 300*l.* per annum for forty-two years and 350*l.* for the last twenty-one years of the lease. These terms, after considerable discussion in the Council, were accepted, and out of a number of competitors Mr. R. H. Vertegans, of the Chad Valley Nurseries, Birmingham, was appointed to lay out the park, his plan being awarded the first premium of 50*l.* offered by the Corporation for the best design. The sheets of water cover eight acres. The lodges at the Bath-road and the Whitmore Reans main entrances are built of pressed red bricks, from the Adderley Park Company, at Birmingham, with stone dressings from the Darley Dale quarries, Derbyshire, the style being Old English, with partially timbered gables. They contain, on the ground floor, two living-rooms (each having a window overlooking the entrance-gates), kitchen, and scullery; and upstairs there are two good rooms. Behind each lodge there is a small yard containing the necessary out-houses, and the coping of the wall enclosing the yard is broken and embattled to be in keeping with the lodge. The whole of the structural works have been carried out under the supervision and from the designs of Mr. G. Eastlake Thoms, C.E., the borough engineer. Messrs. Bradney & Co. have been the contractors for the lodges, shelters, &c.; Messrs. P. Horsman & Co. the contractors for the masonry work of the boundary fence; and Messrs. Bayliss, Jones, & Bayliss, have constructed the iron palisades and ornamental gates.

Halifax.—The new Shroggs Park, Halifax, is to be opened on Midsummer Day. It will be 24 acres in extent, and is the third public recreation grounds for Halifax.

Burnley.—Alderman Scott, J.P., one of the ex-Mayors of Burnley, who was interred on the 2nd inst. at the cemetery, has left 10,000*l.* for a public park. He gave 1,600*l.* to the Mechanics' Institute two years ago.

THE VALUE OF LAND AND BUILDINGS IN THE STRAND.

LAST week a freehold house and shop on the south-side of the Strand, opposite to the Adelphi Theatre, and near the corner of Adam-street, was offered for sale at the Auction Mart, by Messrs. Debenham, Tewson, & Co. The premises, which for many years past have been occupied as a cigar divan, have a frontage of 14 ft., by a depth of 63 ft., covering a ground-area of about 882 ft. The property was sold for 9,700*l.*, with possession, being at the rate of about 11*l.* per foot. The estimated rental is 400*l.* per annum.

Scaffold Accident in Rome.—By the falling of a scaffolding in Rome two men have been killed and four other persons so seriously injured that they are not expected to recover. The planks of the scaffolding are said to have been quite rotten. It is stated that the superintendent of the works has been arrested.

PAYMENT FOR WORK.

MIDLAND LAND AND INVESTMENT CORPORATION (LIMITED) *v.* PETO.

THIS was an action to recover 14,000*l.*, alleged to have been paid under a mistake of fact.

It appeared that one Godbold having obtained possession of a plot of ground in Chancery-lane, entered into an agreement with the defendant by which the latter was to build upon it an extensive set of chambers for 77,660*l.*, according to certain plans and specifications already prepared. By the agreement, the defendant was not to deviate from the plans or to do extra work without the authority in writing of the architect, nor to do any extra work without the previous written consent of the plaintiffs, who were about to advance money to the amount of 70 per cent. upon the contract price of the works executed for the completion of the contract, under a contemporaneous tripartite agreement between themselves, Godbold, and the defendant. The plaintiffs, it was said, supposed that the original plans were being carried out, and they paid upon that footing; whereas, in fact, new plans were prepared and the buildings were erected, it was stated, for a considerably less sum than was contemplated, whereupon the plaintiffs declared there had been omissions and variations from the original contract, which had reduced the price of the work done, so that the defendant was entitled only to a reduced payment, and they brought this action to recover 14,000*l.* paid, as they maintained, under a mistake of fact, the mistake being that the architect's certificates had been given upon the original plans and contract price, and not upon the actual value of the work based upon the bill of quantities. The defendants contended that the contract was for a lump sum of 77,660*l.*, and that the new plans, which were, moreover, sanctioned by the plaintiffs, resulted not in a decrease, but in an increase of work. At the trial before Mr. Justice Denman, at Warwick, the jury were discharged, and the learned Judge ultimately gave judgment for the defendant.

The plaintiffs appealed, and the case came before the Court of Appeal, before Lords Justices Bramwell, Brett, and Cotton.

Their lordships affirmed the judgment of Mr. Justice Denman, and held that no money had been paid under such mistake of fact as to entitle the plaintiffs to recover it back from the defendant.

A CONTRACTOR'S CLAIM.

MARTIN *v.* THE BOARD OF WORKS FOR THE POPLAR DISTRICT.

THIS action was brought to recover the sum of 2,000*l.*, under the circumstances to be gathered from the opening statement on behalf of the plaintiff.

Mr. Waddy, in stating the facts of the case to the jury, said the plaintiff is a builder and contractor, carrying on business at the Grove Steam Saw Mills at Stratford, and the defendants are the Board of Works for the District of Poplar. In the year 1877 the defendants resolved to erect a fever and small-pox hospital at West Ham, and for that work the plaintiff, amongst others, tendered, and his tender was accepted by the defendants, and a contract under seal was executed by the plaintiff and the defendants on the 17th day of August, 1877, by which it was agreed that the plaintiff should complete the buildings according to the plans, specifications, and detailed drawings, to be supplied by Robert Parker or other surveyor or architect, for the time being, of the defendants, and with such alterations or deviations as might be directed, at the price of 12,548*l.* It was also agreed that the works should be carried on without delay, and that the plaintiff should provide, erect, and keep all requisite scaffolding, plant, sheds, &c., until the completion of the work, and complete the work on the 29th of September, 1878. The defendants, by the contract, agreed to pay to the plaintiff sums amounting to 80 per cent. of the value of the work done until the value of the work should amount to 6,000*l.*, and then in amounts of not less than 500*l.*, the full value of the work subsequently done. The defendants also agreed to pay the sum of 1,200*l.*, being the balance of 20 per cent. upon the sum of 6,000*l.*, as to one moiety on the completion of the work, and the residue at the expiration of three calendar months after the defendants' surveyor should have certified that the whole of the works had been executed to his satisfaction. Mr. Waddy alleged that Mr. Parker declined to act, and Mr. E. L. Bracebridge, one of the members of the defendant Board, was appointed to act as architect and surveyor, and did so act during the erection of the buildings. The claim of the plaintiff arose from the fact that, although he was willing to complete and could have completed the buildings on or about the time agreed upon, Mr. Bracebridge neglected, and refused for a long time, though often requested, to supply the plaintiff with the requisite plans and detailed drawings, whereby the plaintiff was prevented from covering in and finishing a large portion of the building, and was put to great expense in covering the work done and protecting it from the weather, and in maintaining and keeping a large quantity of plant, scaffolding, &c., for a much longer time than was reasonably required, during which time the plaintiff wholly lost the use of, and was obliged to pay, large sums for the hire of the plant and scaffolding, and that owing to this neglect and delay, the building was not finished until the month of May, 1879.

Mr. Baron Pollock asked for a copy of the contract, and on referring to it said he did not find that Mr. Bracebridge was mentioned in it. How did the learned counsel get rid of the contract?

Mr. Waddy said, in answer to his lordship, that the plaintiff's claim was *dehors* the contract that Mr. Bracebridge was servant of the defendants, and for his acts they were liable.

Mr. Baron Pollock.—This is another unfortunate attempt to get rid of a contract duly sealed by the defendants as a corporate body, under which Mr. Parker, the surveyor, had to give certificates, and was actually judge between the parties. He did not gather that any imputation was made against Mr. Parker.

Mr. Waddy.—No; I think Mr. Parker would have acted with fairness if he had been allowed to do so by Mr. Bracebridge; but the latter took the superintendence of the job, and although he did not sign the certificates, yet he at all times was instrumental in preparing them.

Mr. Baron Pollock.—You have not alleged one fact to take this case out of the ordinary law regulating contracts of this description. If Mr. Bracebridge did interfere, it was competent for the plaintiff to have said, "I do not know you; I am working under Mr. Parker. He it is to whom I look for instructions in this building," and he could have ordered Mr. Bracebridge off the ground, and declined to recognise him in any way.

Mr. Waddy and his learned junior endeavoured to escape by argument from the ruling of the judge, but without success.

Mr. Baron Pollock, turning to the jury, said, "Gentlemen, you have not been troubled in this case, for it is a simple question of law, and I hold the plaintiff cannot recover in this action, and you will therefore find a verdict for the defendants."

His lordship then certified for the special jury.

PURE AIR AND RADIATING HEAT.

SIR,—Mr. Eglington writes [p. 715, *ante*] that he would "be glad to aid in dispelling the delusion that the air of a room can be warmed by radiation." Then he directly says we light a good fire after a frosty night and the radiation flies off to the ice in the window and melts it, excepting above the meeting-rails, where it is longer, to his surprise, in melting. Really the childishness of this argument is so ridiculous that I must relate an incident. Last winter, noticing the frost on my window just above the meeting-rails, I asked my little daughter (aged nine years) the cause of it remaining so long. "She supposed it was caused by the cold air from the outside rushing up between the rails and so preventing the warm air from the room getting at it." Mr. Eglington does not believe in radiation, and yet he says the heat by radiation flies off and warms the room, and also instances the fire-screen as being useless in checking the heat if the air of the room is made warm by it. Surely everybody knows a fire-screen is simply to obstruct or check the direct rays of heat from an object, and if the screen were made of non-conducting materials, as tin in the ordinary meat-screen, it would effectively intercept the rays of heat, and return them in a great measure back to the fire; but from screens made, say from wool or oilcloth, the rays of heat are only diverted, they are not radiated, absorbed, or conducted.

I imagine no person would attempt to warm a room by radiated heat alone. That it will greatly assist in warming rooms is well known. Example: a highly-burnished and bright grate will be more effective in warming a room than a coarsely-finished black grate, simply because the heat is radiated from the bright surface, and diffused throughout the room. But in the case of the black grate, the greater part of the heat striking the metal surface is conducted through it, and absorbed by the brickwork at the back. Again, if a sheet of bright metal were placed at an angle in the window reveal, so as to catch the rays of the sun, whether the window be open or closed, it would quickly be apparent that radiated heat can be used for partially warming a room.

ROBERT CRANE.

THE ENGLISH LAND SYSTEM.

SIR,—I think your correspondents and others who lay the present depressed state of agriculture to our land system, although that system may not be perfect, are altogether wrong. It is quite true that thousands of acres are going out of cultivation in this country, and unless something is done for the farmer no doubt all the very poor land must follow, but it is chiefly the improvements in ship-building and machinery that are the cause. Thus the "compound surface condenser" not only saves the fuel, but it enables so much more cargo to be carried in the place of that fuel, while the boilers last three times as long, bringing us into competition with the pick of the land in finer climates, for instance. In America there is good, bad, and indifferent land just as there is in England, but while there they only attempt to cultivate the former,—which, with their immense regions, they can afford to do,—we in this confined, over-populated country, cultivate, or endeavour so to do, almost everything. A very large proportion of what we plough up a Canadian would ridicule the idea of working, for it is only made to grow anything by a regular system and large outlay in manure utterly impossible to a colonial.

Another point often urged against our system is that it prevents the improvement of the land; the fact, however, is that the average production of the corn land of this country,—which consists of, as I said before, good, bad, and indifferent,—is, I believe, very nearly twenty-four bushels to an acre, against fifteen bushels the estimated product of only the best land of the United States and Canada, showing what that system has done for Great Britain.

Your correspondent of the 7th ult.—in speaking, too, of "excessively high rents to keep up the noble landlord's luxurious establishments,"—seems not to be aware of the well-known facts, firstly, that, as a rule, the larger the estates the lower the rents, it being the small owners that extract the extreme rents from their tenants; and, secondly, that on the poorer lands and smaller farms the rent is generally barely enough to pay 5 per cent. interest on what the farm house and buildings would cost; and this is gradually causing the extinction of that class of holding, the farm buildings on large farms being comparatively small in proportion.

The prospects of agriculture in England are, I am sorry to say, seemingly unrealised by our present Government. Rich land can take care of itself, as the landlord will simply have to reduce the rent; but what will become of land that will not only carry no rent, but will not produce enough at present prices to pay for its cultivation and rates? That is what we have to consider, and not the talking of the "barbarities of the land system," whatever that may mean.

I should like to hear some practical man's views on the subject.

A HAMPSHIRE MAN.

FORMATION OF TRAMWAY.

SIR,—Perhaps some of your readers would kindly give me a few hints as to the best description of "permanent way" to lay down for a steam tramway, to carry goods as well as passengers?

H.

A FEW MORE WORDS ON QUANTITIES.

SIR,—Regarded as an historical account of the rise and progress of quantity surveying, the article signed "A. B. C." is most interesting and useful; the arguments, moreover, against the practice of architects taking out their own quantities seem to me unanswerable, although many more could be urged on the same side. But a quantity-surveyor may be allowed to demur to the summary fashion in which the writer classes quantity-surveyors as a kind of necessary evil which the conditions of modern business unhappily compel the public to tolerate for the present. One of our chief London surveyors remarked at the recent Conference that, during his experience, he had observed that his profession had undergone gradual but considerable change, and I venture to say that in no respect is this more true than as regards the status of its members. The point of view of "A. B. C." is appropriate rather to the state of things of five-and-twenty years ago than to the circumstances of the present time. Formerly the quantity-taker was regarded as a sort of builder's clerk, whose sympathies were all with the contractor, of whom he was only too probably a furtive ally, and the architect found it necessary constantly to guard against "the danger of collusion between him and the contractors estimating." There was even a trace of this notion in the speech of Professor Kerr at the Conference. How different now is the standing of the men who pursue the scientific branch of architecture called quantity-surveying we all know, and the younger men who have adopted this calling owe a deep debt of gratitude to the fathers of the profession who have raised it to its present position. There is no more honourable or more trusted set of men engaged in any of the multifarious callings connected with building. Intimate acquaintance with the details of construction, precision, accuracy, method, independence of judgment, character, are some of the essential qualifications of a good surveyor, and no one will deny that the best men possess all these. There are probably no other men who are so constantly called on to look at building questions from both the architect's and the builder's point of view, or are in a better way for acquiring an impartial habit of mind. The fact that in building disputes the professional umpire agreed on is now commonly a surveyor sufficiently attests the accuracy of these remarks.

To the statement that "if an expeditious and inexpensive manner of multiplying copies of the drawings and specifications could be devised, and each builder were to make his own estimate, the quantity-surveyor would be unnecessary," I must also take exception. The increasing practice of builders when asked to tender without quantities supplied is either to refuse to tender at all, or to send the drawings to a surveyor, and to tender on his quantities, and (as architects decline to furnish builders with the names of the other competitors) under the system proposed, in a large competition, probably several surveyors would be employed, instead of one. The successful builder would be obliged to include in his contract price, besides his expenses and profit on the particular work, a sum which would recoup him for his expenses on other works for which he had competed unsuccessfully, and the result would be probably an increased employment of surveyors, and certainly a distinct rise in the cost of building. With regard to the "personal equation" to which your contributor refers, this would have more influence under his system, where each competing builder would measure and estimate from the drawings for himself than where all accepted the quantities of one trained surveyor. Other things being equal, the man who tended to a minus quantity would measure short, and would get the work. As time went on he would discover his errors, and the difficulties that usually occur when a contractor has taken work at a price that will not pay him would ensue.

There is a point which "A. B. C." entirely passes over, and of which little was said at the Conference, viz., the modern custom of depositing with the architect or his surveyor a set of priced bills of quantities for the purpose of valuing variations. This, however, has always seemed to me one of the most important uses of quantities. The trouble and disputing which it has saved are simply incalculable. Not only is an almost perfect schedule of prices thus at once obtained, but the contractor's interest

ceases to lie in the direction of variations, which in the absence of high rates of payment are not profitable. To this it is due that the constant striving to procure departures from the contract with which we all used to be so familiar has become a thing of the past. And the convenience of this practice furnishes another reason why architects will be loth to abandon the custom of appointing a surveyor to supply quantities on their behalf.

F. H. A. HARDCASTLE.

QUESTIONS IN COLOUR.

SIR,—It is almost needful to remind your readers that this correspondence began with an expression of regret that the study of colour was not more popular. I doubt whether any subject can be made more popular by being overlaid with the phraseology of scientists, or by the inaccurate conduct of experiments.

If Mr. Standage cannot see that complementary colours placed in juxta-position "heighten" each other, it must be that his eye is not sensitive to fine gradations of colour; for it is a practical fact, known and acted upon by the painters of all ages.

Your other correspondent, "W. C. T.," says that I commit a solecism, in my last letter, when I "speak of the mixing of colours." "Colours cannot be mixed; we cannot mix sensations." Well, I am not sure about sensations,—the experience of the palate leads me to think that "mixed sensations" are not impossible. But, as to "the mixing of colours" I did not use the phrase.

I, however, commend to "W. C. T.'s" attention the following passages, taken almost at hazard from one of Mr. Spottiswoode's chapters on "Polarised Light":—"The results of combining two or more colours of the spectrum have been studied by Helmholtz, Clerk Maxwell, Lord Rayleigh, and others." Again, "The combinations considered in former experiments are those of simple colours; the present combinations are those of mixed tints," &c.

Can "W. C. T." put those two statements into clearer form? Until he can, I may be excused for preferring the simple language of the President of the Royal Society to the possibly more scientific and less intelligible "nomenclature" which your correspondent advocates.

J. D. CRACE.

SOCRATES ON TECHNICAL EDUCATION FROM THE PHÆDRUS OF PLATO.

ACCORDING to the traditions of the Egyptians, the god Theuth first discovered number and the art of reckoning, geometry and astronomy, the games of chess and of hazard, and likewise letters. But Thamus was at that time king of all Egypt, which the Greeks called Egyptian Thebes; but the god himself they denominated Ammon. Theuth, therefore, departing to Thamus, showed him his arts, and told him that he ought to distribute them amongst the other Egyptians. But Thamus asked him concerning the utility of each; and upon his informing him, he approved what appeared to him to be well said, but blamed that which had a contrary aspect. Theuth is reported to have fully unfolded to Thamus many particulars respecting each art, which it would be too prolix to mention. But when they came to discourse upon letters, "this discipline, O king," said Theuth, "will render the Egyptians wiser, and increase their powers of memory, for this invention ministers to memory and wisdom." To this Thamus replied, "O most artificial Theuth, one person is more adapted to artificial operations, but another to judging what detriment or advantage will arise from these productions of art; and now you, who are the father of letters, through the benevolence of your disposition, have affirmed just the contrary of what letters are able to effect. For these, offering a substitute for memory in the soul of the learner, and leading him to trust to the external and foreign marks of writing, will prevent him from fully exercising the native and internal powers of his mind, so that letters do not minister to the powers of the memory, but the very reverse. You will likewise, by these, deliver to your disciples an opinion of wisdom, and not truth. For in consequence of there being many readers without the instruction of a master, the multitude will appear to be knowing in many things, of which they are, at the same time, ignorant, and will become troublesome associates in consequence of possessing an opinion of wisdom instead of wisdom itself. Hence, he who thinks to commit an art to writing, or to receive it, when delivered by this means, so that something clear and firm may result from the letters, is endued with great simplicity, and is truly a believer in the prophecy of Ammon, who is of opinion that something more is contained in the writing than what the symbols themselves inform the reader. For that which is committed to writing is similar to a picture. For the figures in a picture seem to project as if they were alive; but if you ask them any question, they are silent in a perfectly venerable manner. Just so with respect to written discourses; you would think that they spoke as if they possessed some portion of wisdom. But if, desirous to be instructed, you interrogate them about anything which they assert, they signify one thing only, and this always the same. And every discourse, when it is once written, is everywhere similarly rolled among the public, even among those by whom it ought not to be heard, and is, in itself, perfectly ignorant whom it should address and whom not, and when it is either reviled or critically examined, it requires the assistance of its parent; for of itself it can neither resist its adversary nor defend itself.

There is, however, another kind of discourse much better and more powerful than this. I speak of the living and animated discourse of one endued with knowledge, which is able to defend itself, and which knows to whom it ought to speak, and before whom it ought to be silent, and of which written discourse may justly be called an imperfect image.

But shall we say that the man who possesses the science of things just, beautiful, and good, is endued with less intellect than a husbandman, with respect to the seeds which he sows? He will not therefore with anxious and hasty diligence write them in black water, sowing them by this means with his pen; since it is by such means impossible to assist them with speech and sufficiently demonstrate their truth. In my opinion, a fuller harvest will result from living discourse, when genius, employing the dialectic art, shall plant and sow in the minds of its auditors. Living discourse can help itself and reply to all interrogatories. Discourse of this kind is most prolific, it abounds with seed, and the sower is blessed in as high a degree as is possible to man. But it should be recollected that no one can acquire perfection in this art either with respect to teaching or persuading, till he is thoroughly acquainted with the subject on which he proposes to discourse, till he is able to define the whole, and to divide it rightly, neither speaking haphazard, nor descending to rhodomontade." METER.

ENGLISH JOINERS.

SIR,—In your issue of the 14th ult., you say Mr. Sandell has 20,000 doors always on stock, of Swedish manufacture, and I suppose other merchants of London have their thousands, too, on hand. Is not that a poor look-out for young men or our apprentice boys who are striving to learn the trade of carpenter and joiner? And it must stagger the parent who is about to give 30*l.* or 40*l.* for his boy to learn a good trade which he always took so much delight in himself. The parent, if he has any discernment in him, must see that the joiner will soon be a thing of the past, and men will see that the day will come when England will look round for her joiners, and ask, "Where are they?" What say our builders to this? Are they in such a hurry to get rich that they neglect the tender shoots of our trade? Is the boy to be thought of no more? Is the joiner to be ruined? If our builders were to think for a moment, they would see that in our own good joiners' shops we can hold our own with any Swedish firm if we are only rightly encouraged.

BRACE AND BITTS.

PLAGUE OF FLEAS.

SIR,—I am the surveyor to an estate on which there are a large number of small tenements. Two or three of these have become unfortunately so infested by fleas as to be all but uninhabitable.

Can any of your practical readers tell me of a sure way to get rid of this plague? If so, they will much oblige,

S. R. T.

The Works of John Norden.—The original works of John Norden, the Elizabethan surveyor, are of so high a degree of rarity, that the recent appearance of three of his maps, dated 1595,—those of Essex, Hampshire, and Middlesex,—deserves a record. They were sold at Messrs. Sotheby's last week for 23*l.* The map of Middlesex, on a much larger scale than the well-known engraving, is an extremely interesting specimen of the work of one who may fairly be considered our earliest accurate topographical draughtsman.—*Athenæum.*

PROVINCIAL NEWS.

Durham.—The Post-office Buildings Company (Limited) are at present erecting a block of buildings in the rear of the new post-office, Sadler-street, Durham. The work is being carried out under the supervision of Mr. C. Hodgson Fowler, architect, and the contract is held by Messrs. Geo. Gradon & Son, and amounts to 2,800*l.* The sub-contractors are,—Mr. W. Wardropper, mason; Mr. Jas. Laidler, plumber and ironfounder; Mr. W. Blakey, slater; Mr. T. Nesbitt, plasterer; and Mr. G. Smethwaite, painter and glazier. The buildings consist of two blocks of warehouses facing one another, with an open yard between, and at the end a caretaker's cottage of four rooms, with yard and outbuildings.

Bishop Auckland.—At the last meeting of the Burial Board, the author of the selected design for the new cemetery,—Mr. Pritchett, of Darlington,—attended, and received instructions to prepare the drawings and specifications necessary for obtaining tenders.

Darlington.—The appointment of surveyor to the Duke of Cleveland's Building Estate having become vacant, Mr. Pritchett, of this town, has been selected for the post.

Liverpool.—The Seacombe Hotel, which has been erected by a company on a site close to the ferry approaches, was opened on the 28th ult. It has its main frontage towards the Mersey (a promenade of 12 yards wide only intervening between the hotel and the river). There are thirty-six bedrooms, besides private and public sitting-rooms, coffee and dining rooms, drawing-room, commercial room, large banquet-hall or assembly-room (73 ft. by 25 ft. by 22 ft. high), smoke-room, billiard-rooms (public for three tables, private for one table), spacious kitchens, and usual offices. The contractors for its erection were the Messrs. Monk & Newell, of Bootle, who were also the contractors for the new Seacombe approaches, whilst the architect was Mr. C. Grayson, of Liverpool. The whole of the furnishing and decorations has been carried out under the supervision of Mr. G. Bradbury.

Stacksteads (Manchester).—The new premises which have been erected in Newchurch-road, Stacksteads, as the future habitation of the Stacksteads Constitutional Association, and which are to be known as the Beaconsfield Club, were opened on the 28th ult. On the first floor is the reading-room, 29 ft. long by 18 ft., approached by a staircase, 13 ft. 6 in. by 10 ft., with pitch-pine newels and handrails, French polished. On this floor lavatory accommodation is provided, also a kitchen for the steward or caretaker, with cooking-range and other conveniences. The whole of the top floor has been devoted to a billiard-room, 33 ft. by 29 ft. Nearly the whole of the ground and basement floors will be let off for shop or other business purposes. The three fronts are of local stone, and the principal feature in the main elevation is a large oriel window, two stories in height, partly filled with stained glass. The building is in the Domestic Gothic style, half-timbered work being sparingly introduced into the main gable. The architect is Mr. Lawrence Booth, of Manchester, under whose supervision the whole of the works have been carried out. The contractors have been:—For the stonework, Mr. Henry Coupe, of Waterfoot; carpenter and joiner's work, Mr. John Plane, of Bacup; plumbing and glazing, Mr. John Mensworth; plastering and painting, Mr. James Pilling; and for the slating, Mr. Henry Whitehead.

STAINED GLASS.

Dinnington.—A five-light Munich window, by Messrs. Mayer & Co., representing the "Crucifixion" in the centre, with the "Nativity" and "Christ appearing to Mary Magdalen" on either side, has recently been executed in Dinnington Parish Church, to the memory of the late Mr. John Carver Athorpe, of Dinnington Hall.

Belgrave.—A second Munich window, representing St. Peter and St. Andrew, has lately been erected in the parish church of Belgrave, Leicester, by Messrs. Mayer & Co.

Chelmorton.—A stained-glass east window, executed by Messrs. Jones & Willis, of Birmingham and London (subject, the "Ascension of our Blessed Lord"), and erected by Mr. Thos. Buxton, of Chelmorton, to the glory of God and in memory of his son Richard, has been recently unveiled in Chelmorton Church. The church, an early one, has been recently restored at a cost of about 2,000*l.*

Stretford.—A stained-glass window, by Mayer & Co., representing the "Good and Faithful Servant," has just been erected in the parish church of Stretford, to the memory of J. Hampson, fifty-four years clerk of the church.

CHURCH-BUILDING NEWS.

Plymouth.—When St. Jude's Church, Tothill-lane, was built a few years ago, from the designs of Mr. James Hine, architect, of Plymouth, funds were so low that the execution of the carved work had to be deferred. Now, through the munificence of the Rev. Thomas Bewes, of Beaumont House, the work has been finished. The decorative sculpture just completed has been carried out by the staff of Mr. Harry Hems, of Exeter. The work within and without the chancel is quite distinctive. Acting under the directions of Mr. Hine, Mr. Hems has given to the capitals in the chancel a character strictly their own. The stones are carved into representations of angels,—some bearing scrolls, some singing, others with musical instruments, forming, as it were, a celestial choir. Between the figures the conventionalised forms of the lily, rose, passion-flower, &c., are introduced. The large capitals that support the arcades on either side of the nave are well carved. They take the cushion form, and the well-known work at old Southwell Minster has formed the *motif* for the carver in these capitals. Into them the oak, ivy, maple, thorn, &c., are introduced in conventionalised rendering. The roof corbels in the chancel and transepts are boldly carved, and all the label terminations to the windows, inside and outside the building, are stopped by sculptured heads of saints, virgins, and martyrs. When the spire, now building, is finished, St. Jude's Church, Tothill-lane, will be one of the completest churches in the three towns.

Artleborough (*Northamptonshire*).—On the 28th of April the fine old church of St. Peter was re-opened by the Very Rev. Lord Alwyne Compton, dean of Worcester. The church, which is one of great interest and beauty, has been restored, and "The Story of the Restoration" has been told by the rector, the Rev. Thos. Grabham, in a pamphlet of some seventeen pages. The whole of the roofs are new; and the whole of the seating, which is of oak, is understood to be a careful reproduction of the old. In the chancel, the old stalls, with misereres, have been repaired and refixed. The body of the church has been restored by the parishioners at a cost of 2,500*l.*, and the chancel by the Marquis of Bristol at a cost of 500*l.* The architect was Mr. Peacock, of London; the builders were Messrs. Henson, of Finedon, Northamptonshire.

Broughton.—The little church of St. Lawrence, Broughton, near Newport-Pagnell, has been reopened, after restoration by Mr. William White, F.S.A. Seventeen years had elapsed since the architect was first called in and the good work initiated by the rector, the Rev. J. W. Irving, by whose perseverance it has been at length completed, with the assistance of Mrs. Higgins, of Turvey House, Beds. Great interest is given to the church by a number of old mural paintings. These were opened out many years ago by the present rector. There were indications of several successive layers of subject paintings in distemper over them. They are of late Mediæval date, quaint and rude, and of treatment almost unique. In them are represented St. George with the Dragon, and a diminutive princess; St. Helena finding the Cross; and a *Piéta*.

SCHOOL BUILDING NEWS.

Sunderland.—On the 19th ult. the memorial-stone of a new Sunday school, intended as an adjunct to a Congregational Church yet to be built, was laid on a site on the Grange estate, in Stockton-road. The architect of the school is Mr. J. P. Pritchett, of Darlington, and it is stated that the plan possesses the following advantages:—"1. The scholars, both at the opening and closing of the school, face the superintendent, without any confusion or moving of a single scholar from his or her place. 2. The teacher has every scholar in front of him, and, without moving his head, has his eye upon them. 3. The cost is nearly 50 per cent. below the cost of the most approved Sunday schools yet built." In the plan the superintendent's desk is the axis of a room which is formed by eight sides of a "duodecagon" or twelve-sided figure, all the seats standing at tangents to the semi-diameter, thus directly facing him all round the figure. The outer part of this figure is divided into eight class-rooms, shut off from the centre part by revolving wood shutters lined with indiarubber to exclude sound, and the class-rooms are divided from each other by similar shutters, as the room is also to be used for tea meetings. By this arrangement, when the shutters dividing the class-rooms from the centre part are drawn up, the superintendent commands a direct view of the face of every child, and when the shutters are lowered, which can be done instantaneously, there are eight separate class-rooms in the outer part, leaving a central area for five classes of the more juvenile scholars.

Coldhurst (*Oldham*).—The foundation-stone of a new infants' school has been laid at the junction of Stansfield-street and Ernest-street, Coldhurst, Oldham (in connexion with Holy Trinity Church, Coldhurst). The schools are designed in the Gothic style, and are to be built of red bricks with stone dressings. The roof will be open-timbered, and covered with blue slates. The inside walls are to be finished with pressed bricks, with a dado of white glazed bricks, surmounted with an ornamented glazed string-course. There will be a large school-room, 60 ft. by 24 ft.; two class-rooms, 20 ft. by 20 ft.; cloak-room and lavatory, 18 ft. by 11 ft. 9 in.; main entrance, 18 ft. by 6 ft., leading directly into each class-room and large school-room. The whole of the building will be heated with hot water, and the cost will be about 1,400*l.* Mr. Alexander Banks, Oldham, is the architect; and Mr. Whitworth Whittaker, of Oldham, is the contractor.

Darwen.—The new school for St. James's parish will be in the Gothic style, and will have two lofty turrets on the main ridge, each finished with wrought-iron finial. Playgrounds are provided at each end of the building for boys and girls respectively,—part of each playground being covered in for the use of scholars in wet weather. The site measures 260 ft. by 48 ft., and the school will occupy the centre, and will comprise mixed school, 60 ft. by 42 ft.; infants' room, 36 ft. by 28 ft. (with cellar under); two class-rooms, each 16 ft. by 11 ft.; one, 22 ft. by 20 ft. 6 in.; and another, 22 ft. by 14 ft. 8 in.; besides cloak-rooms and porches. Cloak-rooms are placed in close proximity to both playgrounds and main entrances. The works are being carried out by local contractors, from the plans and under the supervision of Mr. W. Perry, architect.

Miscellanea.

The Artisans' Dwellings Act.—At the meeting of the Metropolitan Board of Works on the 3rd inst., the Works Committee submitted a letter from the Home Office, stating, in reply to applications by the Board for permission to pull down houses in the areas of the St. George-the-Martyr, Southwark, Whitechapel, and Limehouse, and High-street, Islington, schemes, that the Secretary of State deemed it advisable, pending the inquiry about to be instituted by a select committee, not to sanction the demolition of any more houses. The reply ordered to be transmitted to the Home Secretary stated that the Board felt it to be its duty to make another application to the Secretary of State for his sanction to the demolition of the houses. A large number of the houses, comprising, in some cases, entire courts, were altogether and permanently closed, the houses being not only in such a bad sanitary condition as to be uninhabitable, but the very structures being for the most part in a dangerous state, and some of them little better than ruins. The other houses which were still occupied were mostly in such a condition that the Board could not take the responsibility of allowing them to remain standing and inhabited.

Art Students' Home.—The Princess Mary Adelaide (Duchess of Teck) on the 3rd inst. visited the Art Students' Home, Brunswick-square, of which she is patroness. Her Royal Highness, who was received at the Home by the President (the Baroness Burdett-Coutts), the ladies of the committee, and others, expressed satisfaction at the completeness of the arrangements.

Surveyorship, Gravesend.—At a meeting of the General Purposes Committee of the Corporation of Gravesend, held at the Town-hall on the 3rd inst., Mr. Edward Rhodes, of Rudford, Yorkshire, was appointed surveyor for the borough, in the room of Mr. Buckham, resigned.

British Archæological Association.—The closing meeting of the session was held on the 1st inst., the Earl Nelson in the chair. Mr. G. R. Wright, F.S.A., detailed the progress of arrangements for the Congress at Great Malvern, which will be held in August. Visits will be paid to many places of interest, and, by the invitation of the Mayor and Corporation, two days will be spent at Worcester. Mr. R. Blair described further discoveries at the Roman station, South Shields. Mr. Loftus Brock exhibited a great number of Greek and Asiatic penates, in illustration of the custom still prevalent of destroying the heads when discovered to preserve the finders, as they suppose, from the Evil Eye. The Rev. T. M. Mayhew proceeded to describe a fine collection of glass vessels illustrative of the manufacture of that material from comparatively recent times backwards to a remote period. Mr. Thomas Morgan, F.S.A., called attention to the occurrence of glass mosaics, even in England, and referred as an example to some of the pavements at Brading. A paper was read by Mr. Cuming, on the representation of mermaids in various Middle-age works, and a drawing of a perfect mermaid from a stained-glass window formerly in Great Yarmouth Church was exhibited. Mr. E. Walford reported that the demolition of the old west front of St. Alban's Abbey, under the plea of its restoration, had actually commenced.

Hospitals for the Poor.—The series of drawing-room lectures given under the auspices of the National Health Society at the residence of Mr. Matthews, Hertford-street, Mayfair, was concluded on the 27th ult. by a lecture by Mr. H. C. Burdett, on "Hospitals Old and New; Hospital and Home Nursing." The lecturer contrasted the present provision of hospitals for the poor chargeable to the rates with the provision which existed before the passing of Mr. Gathorne Hardy's Act of 1867. He pointed out the great advance which had been made as to the nursing of the Poor-law sick, for in place of the sick poor being intrusted to the care of irresponsible pauper nurses and the sick of all classes mixed together, there were trained nurses in attendance upon the sick poor, and the sick were now properly classified. Mr. Burdett insisted upon the necessity for training nurses, and he urged that when hospital patients could pay they should be made to pay.

The Prince Imperial Memorial.—The memorial to Prince Louis Napoleon, which has been sculptured by Mr. J. E. Boehm, and which arrived a few days ago at Windsor, has now been fixed in the Braye Chapel, in St. George's Chapel. The site on which the memorial has been placed was chosen by the Queen, and to make room for it an ancient font has been removed. The monument bears inscriptions at the base. Upon a tablet there is the following extract from the Prince's will:—"Je mourrai avec un sentiment de profonde gratitude pour Sa Majesté la Reine d'Angleterre, pour toute la famille royale, et pour le pays où j'ai reçu pendant huit ans une si cordiale hospitalité. Testament du Prince Impérial, 26 Février, 1879." The centre tablet at the right of the base contains the prayer written by the Prince, which was found after his death.

Artificial Seasoning of Timber.—Mr. C. René, pianoforte manufacturer, of Stettin, Germany, as reported in *Engineering*, has devised a plan by which he utilises the property of oxygen, particularly of that ozonised by the electric current, to artificially season the timber used for the sounding-boards of musical instruments. The first impulse to experiments being carried out in this direction was given by the well-known fact that wood, which has been seasoned for years, is much more suitable for the manufacture of musical instruments than if used soon after it is thoroughly dried only. Mr. René claims that instruments made of wood which has been treated by his oxygen process possess a remarkably fine tone, which not only does not decrease with age, but, as far as experience teaches, improves with age as does the tone of some famous old violins by Italian masters.

The South Esk Viaduct.—The viaduct across the South Esk, in connexion with the Arbroath and Montrose Railway, having been condemned by Colonel Yolland, of the Board of Trade, a new bridge, from plans by Mr. Galbraith, C.E., London, is to be erected. The tender of Messrs. W. Arrol & Sons, Glasgow, for the erection of the new bridge, has been accepted, and a commencement will be made in the course of a week or two.

What is an Engraving?—Mr. Collier, a Lancashire county court judge, has just been called upon to adjudicate on the question, What is an engraving? Mr. G. F. Sargent, artist, sued Mr. E. S. Braddyl, broker, of Liverpool, for seven guineas, the price of a proof copy of the picture, "The Liverpool Flags." Mr. Sargent visited Liverpool in 1878 to paint a representative picture of commercial celebrities of Liverpool, and a number of gentlemen had their portraits taken for the purpose of being introduced in the picture. The defendant was one, and he signed a contract for a proof copy. The picture had been delivered to the defendant, who objected to pay on account of the way in which it had been produced, namely, by a cheaper process than ordinary engraving, and known as photo-gravure. It was stated in the printed prospectus of the Liverpool picture that the reproduction for the subscribers would be by "Goupil's engraving process." Mr. Sargent gave evidence of these facts, and said he should speak of the reproduction by the Goupil process as "an engraving." Mr. Edward Grindley, Liverpool agent of M. Goupil, said the picture came fairly within the description of a copy or proof. He recommended the adoption of Goupil's process as the best for a picture containing a large number of portraits, because it reproduced the portraits more accurately. The defence was that the article delivered was not an engraving as contracted for. The judge said the contract was merely for a copy; but, even if the word "engraving" were used, the evidence was that what the defendant received was an engraving by a peculiar process. The contract had been satisfied. Judgment was given for the amount claimed.

Lower Thames Valley Sewerage.—At a special meeting of the West Kent Main Sewerage Board, held on the 1st inst., the whole Board in committee recommended the amending of the resolution of the 13th of April last, and that the secretary be directed to inform the Local Government Board that, in deference to their wishes, this Board will be prepared to adhere to their offer to admit the sewage of the Lower Thames Valley District into the West Kent main sewers, upon payment of a capital sum of 100,000*l.*, but subject to the offer being definitely accepted before the 1st of July next, and to the Lower Thames Valley Main Sewerage Board becoming a constituent authority, within the meaning of the "West Kent Main Sewerage Act, 1875," and the Acts amending the same, upon the terms of contributing to the expenditure and establishment charges of the Board (exclusive of loans for construction of existing main sewers) according to the rateable value of their district. On the suggestion of Mr. Rhodes, the consideration of the matter was adjourned to a special meeting, to be held on July 15th.

Pictures at Cambridge.—The Fitzwilliam Museum Syndicate, in their report, just issued, state that since their last report they have caused the entire collection of pictures to be rehung, with a view to their better arrangement and exhibition. The collection of pictures has been enriched during the past year by two donations,—viz., a "Madonna and Child," by Pinturicchio, presented by Mr. S. Sandars, M.A., of Trinity College; and "Jacob's Dream," by Professor Legros, presented by the artist. The Museum was visited by 53,684 persons during the year ending April 30th, 1881. Permission was given during the same period to 65 persons to copy in the picture-gallery, to eight in the sculpture-gallery, and to four in the library. Professor Colvin and Dr. Waldstein have made donations to the sculpture-room. Additions have also been made to the collection by purchase.

The New Organ erected at Whitefield's Tabernacle, Tottenham-court-road, was opened on Thursday, May 26th, by Mr. Rose, the organist of St. Pancras Church. It has been erected, at a cost of several hundred pounds, by Messrs. Bishop & Son. The case, of oak, is from designs by Mr. Alfred Burr, architect. The pipes are of spotted metal. The mechanism and wooden pipes are varnished, to protect them from the damp and atmospheric variations. The pipes number 1,056.

The Building Trade in the City.—We understand that the building trade in the City is at present in a somewhat depressed condition, very few new works of importance being in progress. This is doubtless the result of overbuilding during the last two or three years, many warehouses and shops recently erected remaining without tenants.—*City Press.*

Artificial Indigo.—An interesting discourse was recently given at the Royal Institution by Professor Roscoe, F.R.S., on "Indigo and its Artificial Production." The Professor reminded the members of the Institution that eleven years ago he had laid before them an account of a discovery in synthetic chemistry of high importance, that of the artificial production of alizarine,—the colouring substance of madder. That was the first time the colouring substance of a plant had been artificially obtained from mineral products. He had now, he said, to give an account of a second striking case of synthetic chemistry in a similar direction,—the artificial production of indigo. It was another proof of the fact that the study of the most intricate problems of organic chemistry and those which appear to many to be furthest removed from any practical application are in reality capable of yielding results having an absolute value measured by hundreds of thousands of pounds. The value of indigo imported into this country during 1879 amounted to close on two millions sterling, so that if artificial indigo can be produced at a price to compete with natural indigo, there is a wide field open to its manufacturers. The artificial production of indigo may even now be said to be within measurable distance for commercial success, for the ortho-nitro-phenyl-propiolic acid (called for short propiolic acid), the colourless substance which on treatment with a reducing agent yields indigo-blue, is already in the hands of the Manchester calico printers, and is furnished by the Baden company for alkali and aniline colours at the price of 6*s.* per pound for a paste containing 25 per cent. of the dry acid.

The Metropolitan District Railway Bill.—A select committee of the House of Lords have given their decision with respect to the above Bill, which proposes to extend the line from Ealing to Uxbridge. The Great Western Company opposed, on the ground that the line ran almost parallel with theirs; but, on the other hand, it was alleged that a new district was opened out. The committee declared the preamble not proved. The question of ventilating the existing tunnels on the line was then discussed. It is stated to be intended to convey the smoke through a subway into the river (?) near Blackfriars Bridge and Queen Victoria-street. The committee decided to allow ventilation, subject to full powers being given to an arbitrator appointed by the Board of Trade as to the best mode of carrying out the ventilation. In response to an appeal made on behalf of the Metropolitan District Railway, leave has been granted by the select committee to allow the company to withdraw from their Bill those clauses which recently passed the House of Commons for the erection of a larger and more permanent station at Charing-cross.

Market Harborough.—On the 10th ult. Major Tulloch, R.E., held an inquiry at the Corn Exchange, Market Harborough, upon an application of the Local Board to borrow 16,000*l.* for works of main sewerage and sewage disposal. The plans, sections, &c., prepared by Mr. E. G. Mawbey, the engineer for the works, were submitted to the inspector, who, after taking the evidence of Mr. Mawbey and of Mr. J. B. Everard, of Leicester, the consulting engineer, inspected the land proposed to be taken for the disposal area. The system to be adopted is intermittent land filtration. From what transpired there is no doubt that the scheme met the inspector's approval, and that permission to raise the required loan will be granted. The district has been exposed to most disastrous floods, which, according to the report of the Medical Officer of Health, have seriously affected the health of the inhabitants, and it was explained to the inspector that it was proposed to deal with floods and storm-water in a separate scheme, which had also been prepared by Mr. Mawbey. The cost of these additional works was stated to be 4,500*l.*

The Newcastle-on-Tyne Church Congress.—Preparations have already been commenced for the Exhibition of Ecclesiastical Art that has of late years proved so interesting an adjunct to the Church Congress. It is to be opened on the 3rd and closed on the 8th of October, and many of the leading manufacturers have already decided to be represented. The loan department, which is always an important feature, will be an unusually large one, consisting of ancient church plate, Mediæval silversmiths' work, embroidery, and similar objects, some well-known collectors having promised to contribute.

Institution of Civil Engineers.—During the session 1880-81, there have been elected forty-seven members, 185 associate-members (of whom fifty-four were previously students), and seven associates; besides which one member and two associates have been restored to the register. On the other hand, by deaths, resignations, and erasures the Institution has lost thirteen members, eight associate-members, and nine associates. The net gain has been sixty-seven members and 148 associate-members, while there has been a decrease of three associates. In the same period the council have admitted 178 students; but as fifty-four have been elected associate-members, as previously stated, and the deductions from various causes have amounted to twenty-six, the effective increase in this class has only been ninety-nine. The Institution now consists of 1,276 members, 1,435 associate-members, 565 associates, eighteen honorary members, and 712 students,—together 4,006. Twenty-five years ago the total of all classes was under 800. On the evening of the 3rd inst. Mr. Abernethy, President of the Institution, and Mrs. Abernethy, received a large company,—over 2,000 in number,—in the South Kensington Museum, the occasion being the fifty-third anniversary of the incorporation of the Institution. The second division of the Architectural Court had been arranged as a reception-room, a winding avenue being formed for the visitors to move through by placing lines of brightly-flowering plants and lines of tall tree ferns between the various objects exhibited in the court. The several picture-galleries were lighted up, and during the evening a selection of dance and operatic music was performed by Kalozdy's Hungarian string band in the Italian Court.

Proposed Stephenson College. — At a meeting of the committee appointed by the Town Council of Newcastle for the purpose of considering the desirability of celebrating the centenary of the birth of George Stephenson, the Mayor of Newcastle occupying the chair, a resolution was unanimously passed, "That this meeting is of opinion that there is no better way of doing honour to the name of Stephenson, and to perpetuate his memory in this district, than by erecting a building in Newcastle for the use of the College of Physical Science, to be called the Stephenson College." The College of Physical Science, which was established and endowed ten years ago in Newcastle by the combined efforts of the inhabitants of that town and the University of Durham, is seriously cramped in its efforts by want of proper accommodation. It is estimated that a sum of 20,000*l.* at least will be required for the purpose of the college buildings. Towards this sum 1,000*l.* have been promised by Sir William G. Armstrong, C.B., and further sums amounting to 2,000*l.* by a few other friends.

Society of Arts Conversazione.—On the evening of the 2nd inst. the Society for the Encouragement of Arts, Manufactures, and Commerce gave a largely-attended and successful *conversazione* at the South Kensington Museum. From about nine o'clock most of the courts and corridors in this capacious building were thronged with people, who divided their attention pretty equally between the special exhibits of the society and the various objects of interest always to be found at this Museum. The reception was held in the Architectural Court by Mr. F. J. Bramwell, F.R.S., the chairman, and other members of the council. During the evening various entertainments were given in different parts of the building. The galleries containing the Raffaelle cartoons, the Sheepshanks collection, the William Smith collection of water-colour drawings, the Dyce and Forster pictures, the "Chantrey Bequest," and other well-known pictures, were visited by large numbers during the evening.

Fire at a Timber-yard.—On the evening of the 3rd inst. what proved to be a very serious fire broke out in the timber-yard of Mr. J. Burton, 196, Old-street, St. Luke's. The timber-yard seems to have been completely surrounded by buildings, several of which, including the St. Luke's parochial schools, fell a prey to the fierceness of the flames. Captain Shaw's official report of the fire contains a long list of properties destroyed or seriously damaged.

Paving-bricks for Brighton.—At a meeting of the Brighton Town Council, on the 1st inst., the Works Committee reported that they had resolved upon purchasing 300,000 paving-bricks, at prices ranging from 3*l.* 7*s.* 6*d.* to 3*l.* 13*s.* 6*d.* per thousand.

Masters and Men.—The Glasgow lath-splitters have been out on strike for an advance of 1½d. per hour. Some of the employers have conceded the demand.——On Tuesday night a mass meeting of Glasgow joiners was held in the Albion Hall, Glasgow, to hear replies from the employers in answer to their request for an advance on their present wages of a halfpenny per hour. The present rate of wages is 6½d. per hour. Mr. W. Paterson presided. The reports of the deputations having been given in, it was found that eighty-four employers, representing three-fourths of the whole number in the city, had promised to give the advance; ten had refused, and a number had not replied. It was unanimously agreed that, in view of the number of favourable replies, the men in the shops from which unfavourable answers had been received should not resume work on Wednesday morning.——The Greenock house joiners have agreed to accept the masters' offer of ½d. per hour advance, and a threatened strike has thus been averted.

New Church of St. Matthew, Bayswater.—On Saturday last the foundation-stone of this new church was laid by Mrs. Allcroft, the wife of the patron of the living. The building is of stone, after the designs of Mr. John Johnson, and the builders are Messrs. Dove Brothers. The style of architecture is Early English. The nave will be 100 ft. long and 49 ft. broad, with a range of twenty clear-story windows, ten on each side. The entire length of the church will be 125 ft., and the breadth, with nave and arcades, 70 ft., and, with the transepts, 90 ft., accommodating about 1,500 persons. The height of the tower and spire is 200 ft. The cost, including house and land for additional site, is 24,000*l.*

Wind Pressure on Railway Structures. In the House of Commons on the 3rd inst., Sir R. Lindsay asked the President of the Board of Trade whether the committee, which he stated in the House of Commons in July, 1880, was appointed to consider what rules it might be desirable to make with regard to wind pressure upon railway structures, had yet made a report, and, if so, whether he would be prepared to lay it upon the table of the House? Mr. Chamberlain said that the report would be made shortly after the Whitsuntide recess, and that he would consider whether it was desirable to lay it upon the table.

The Crown Foreshores of Ireland.—The *Pall Mall Gazette* prints a long letter on the Land Bill, from "A Conservative," suggesting Mr. Gladstone would do well to add to the Land Bill in committee the Crown foreshores for reclamation. There are in Ireland about four millions and a half of acres of waste lands, of which nearly the half are reclaimable, and will be provided for in section 25, part 5, of the Bill. The Crown foreshores occupy about 250,000 acres, which, by the Act of 1866, were vested in the Board of Trade; and if they were embanked and drained, there is little doubt that they would set well in the forty-acre lots.—*Freeman's Journal.*

The Panama Canal.—A *Times* telegram from Philadelphia states that "M. de Lesseps's Panama Canal Company have bought the Panama Railroad, paying for it $250 per share, aggregating $17,500,000, besides leaving the stockholders the present surplus assets of the railroad, worth $45 per share more. Four millions of the purchase-money are to be paid on the 1st of July, and the remainder in five annual instalments, the Canal Company having the privilege of paying all within eighteen months. The Railroad Company retain possession till the entire sum has been paid. They also sell subject to a debt of four millions. The railway cost twelve millions.

The International Medical and Sanitary Exhibition.—His Royal Highness the Duke of Edinburgh, in response to the request of the committee, has consented to become the patron of the Exhibition. The whole of the floor-space will be allotted this week, with the exception of a portion which the committee have decided to set apart for exhibiting the work of journeymen plumbers. Under special regulations this work will be exhibited free of charge, and it will include the specimens of workmanship produced by the competition for the prizes in connexion with the lectures on plumbing now being delivered at the Society of Arts.

Destruction of a Theatre.—The Theatre Royal, Belfast, was destroyed by fire on Wednesday morning. It has been built only seven years, and cost 12,000*l.*

The Channel Tunnel Works.—The boring operations at the Channel Tunnel works continue to advance at a steady but improved rate of progress, the average of which has now been permanently increased to between 60 yards and 70 yards a week, the total length of the heading having now reached a distance of 700 yards. After the workmen have succeeded in boring 250 yards beyond this distance, it is intended to remove the machinery to the shaft near Shakspeare's Cliff Tunnel, and bore to meet the present heading. There is no alteration in the formation of the strata, and the work, which continues to proceed very satisfactorily, has attained a depth of about 25 ft. below high-water mark.

The Obstructive Gates in the Euston-road.—The St. Pancras Vestry have succeeded in obtaining the removal of one of these gates. On the 3rd inst. the Mabledon Gate, the first obstruction in the Euston-road, near the Midland Station, was cleared away, and an important thoroughfare is now open to the public, to be further improved by the demolition of the lodge and adjoining sheds which narrow the entrance.

University College, London.—Professor T. Hayter Lewis has resigned the Chair of Architecture in this College. Mr. T. Roger Smith, who is now conducting the classes, having been appointed by the Council of the College to do so in the current and two previous sessions in the absence of Professor Lewis, is a candidate for the permanent appointment, and will, we hope, obtain it. He has already well proved his fitness for the position.

International Woollen Exhibition.—This exhibition, opened at the Crystal Palace on the 2nd inst. by H.R.H. the Duke of Connaught, is the first of an intended series of exhibitions illustrative of the industries of this country. It comprises wool, woollen manufactures, and machinery in motion.

Hastings.—The erection of a new Roman Catholic Church has been commenced. The cost of the building will be between 8,000*l.* and 10,000*l.*, towards which the poet Coventry Patmore has contributed 5,000*l.*, and the Duke of Norfolk has also given a large donation.

United Arts Gallery, New Bond-street. We are asked to say that this gallery will be open free to the public every Saturday evening during June, from 6 to 10 o'clock.

South Kensington Museum.—The special loan collection of Spanish and Portuguese Art will be opened to the public this (Saturday) morning, June 11th.

TENDERS

For new roads, sewers, and surface-water drains, for the British Land Company (Limited), on their estate at Hornsey. Mr. Henry B. Michell, surveyor:—

Keeble, Regent's Park	£4,336 0 0
Bell, Wood-green	4,145 0 0
Killingback, Camden-town	4,100 0 0
Crockett, King's-cross	4,007 0 0
Acock, City	3,887 0 0
Krauss, Bristol	3,829 0 0
McKenzie, City	3,767 0 0
Harris, Camberwell	3,725 0 0
Nowell & Robson, Kensington	3,710 0 0
Pizzey, Hornsey	3,677 0 0
Jackson, Leyton	3,555 0 0
Dunmore, Hornsey	3,547 0 0
Thompson & Son, Battersea	3,490 0 0
Wilson, Walthamstow	3,350 0 0
Peill, Bromley (accepted)	3,185 0 0

The new roads, sewers, and surface-water drains, for the same company. Mr. Henry B. Michell, surveyor:—

Keeble, Regent's Park	£2,672 0 0
Killingback, Camden-town	2,630 0 0
Bell, Wood-green	2,575 0 0
Harris, Camberwell	2,570 0 0
Crockett, King's-cross	2,481 0 0
Wilson, Walthamstow	2,480 0 0
Pizzey, Hornsey	2,440 0 0
Nowell & Robson, Kensington	2,400 0 0
McKenzie, City	2,391 0 0
Acock, City	2,360 0 0
Thompson & Son, Battersea	2,350 0 0
Dunmore, Hornsey	2,329 0 0
Jackson, Leyton	2,222 0 0
Krauss, Bristol	2,216 0 0
Peill, Bromley (accepted)	2,170 0 0

For Rotherhithe and Southwark sewer, for the Metropolitan Board of Works. Sir J. Basalgette, engineer:—

Kellett & Bentley, Ealing (accepted)	£59,000 0 0

For the construction of 310 feet of river wall and landing-stage at West Ham gas-works, Stratford. Mr. E. H. Thorman, engineer:—

Cox	£3,097 0 0
Wood Bros.	2,983 0 0
Mundy	2,469 0 0
Lawrence	2,348 0 0
Bangs	2,280 0 0
Gardner	2,200 0 0
Perry & Co. (accepted)	2,000 0 0

For patent safety lift, revolving shutters, sun blinds, and pavement lights:—

Clarke, Bunnett, & Co.	£171 15 9

For erecting a new warehouse in Prince's-street, Ipswich, for Mr. W. Jolly. Mr. William Bade, architect:—

Robert Girling	£2,004 0 0
B. W. Whiting	1,998 0 0
D. C. Jones & Co.	1,950 0 0
J. B. & F. Bennett (accepted)	1,825 0 0

For the erection of three cottages on Mayfield Estate, Cribb's-causeway, near Bristol, for Capt. G. Cawley. Mr. E. G. Warren, architect:—

Stephens & Bastow	£799 0 0
Bryant & Tucker	705 0 0
Forse & Ashley	670 0 0
Saville & Co.	655 0 0
Wright & Podger	504 10 0
Herridge	500 0 0
Hunt (accepted)	425 10 0

For repairs, &c. to houses at Malden-crescent, Kentish-town, for M. F. W. Rowney. Messrs. Ebbetts & Cobb, architects:—

R. Perkins	£165 13 0

For alterations and additions to premises, Ock-street, Abingdon, for the Beaconsfield Conservative Club. Mr. E. Dolby, architect:—

Williams (accepted)	£210 0 0

For house at St. Paul's Cray-common, Chislehurst, for Mr. R. H. Boyce:—

Mr. Joseph Dorey (accepted)	£3,158 0 0

For rebuilding the Jack of Newbury, Kensal-road, for Mr. Richard Rogers. Mr. C. H. Thomas, architect:—

Cock	£1,860 0 0
Manley	1,767 0 0
Hook & Oldrey	1,668 0 0

For the erection of a church and schoolroom, with boundary-walls, Greybury, near Edenbridge, Kent, for Mr. J. T. Morton. Mr. S. W. Haughton, architect. Quantities by the architect:—

J. Godley, East Grinstead	£1,804 0 0
H. Wallis, Lingfield	1,783 8 0
G. & F. Penn, Pembury	1,771 9 0
J. Waters, Forest-row	1,504 10 0
E. Vaughan, Maidstone	1,497 0 0
Charlwood Bros. East Grinstead*	1,461 15 0

* Accepted.

For re-building premises, Rampant Horse-street, Norwich, for Messrs. Colman & Co. Mr. E. Boardman, Norwich, architect:—

Cornish & Gaymer	£7,000 0 0
Young	5,633 0 0
Lacey	5,666 0 0
Downing	5,499 0 0
Hawes	5,490 0 0
Wilkin	5,307 0 0

For roads and sewers, at Caistor Park Estate, Stratford, for Mr. J. Edmondson. Messrs. W. Waymouth & Son, surveyors:—

Bloomfield	£3,270 0 0
Jesse Jackson	2,897 0 0
Jno. Jackson	2,886 0 0
Harris	2,835 0 0
Taylor (accepted)	2,815 0 0

For repairs to No. 24, Notting Hill-terrace, for Miss Sneyd. Messrs. W. Waymouth & Son, architects:—

Colls	£182 0 0
J. W. Sawyer (accepted)	173 0 0

For completing two villa-residences at Holly Park, Crouch-hill, for Mr. W. Jenkinson. Messrs. W. Waymouth & Son, architects:—

Churchward (accepted)	£1,288 0 0

For the erection of a new rectory-house for the parish of St. Mary-le-More, Wallingford, for the Rev. C. A. Raymond. Mr. Edwin Dolby, architect. Quantities by the architect:—

	With Grey Headers.	With Yellow Stocks.
Smallbone, Streatley	£2,246 0 0	£2,303 12 0
Dodd, Caversham	2,147 7 4	2,170 7 4
Brasher & Son, Wallingford	2,095 6 9	2,055 0 0
Holly & Butler, Nettlebed	2,078 0 0	2,061 0 0
T. Jones, Oxford	2,038 0 0	2,086 0 0
Silver & Sons, Maidenhead	1,939 0 0	——
T. Selby, Oxford	1,925 0 0	1,948 0 0
Kingerlee, Banbury	1,925 0 0	1,925 0 0
Wheeler, Wantage	1,818 3 1	1,868 3 1
Williams, Abingdon*	1,723 0 0	1,742 0 0

* Recommended for acceptance.

For a new billiard-room, The Abbey, Abingdon, for Mr. J. T. Morland. Mr. Edwin Dolby, architect:—

Thatcher, Abingdon	£320 0 0
Williams, Abingdon (accepted)	257 0 0

For making additions to a pair of villas, Marcham-road, Abingdon, for Mrs. Payne. Mr. E. Dolby, architect:—

Drew, Abingdon (accepted)	£548 5 0

For the superstructure of offices and shops, Gray's-inn-road, for Mr. R. Ryall. Mr. G. Vickery, architect. Quantities supplied by Mr. H. H. Leonard:—

George Crabb (accepted).

For new residences, Oakhurst-grove, Peckham, for Mr. Thomas Bremner. George V. S. Blackburne, architect:—

C. E. Elves, Coynant Works, Mile End (accepted)	£3,900 0 0

For new residences, Carlingford-road, Hampstead, for Mr. Thomas Bremner. George V. J. Blackburne, architect:—

C. E. Elves, Coynant Works, Mile End (accepted)	£5,100 0 0

For altering and building additions to Nos. 1, 2, and 3, Avenue-place, Turnham-green, for Mr. Thomas. Mr. Geo. Whitaker, architect:—

Whitman	£1,917 0 0
Wildman	1,575 0 0
Hook & Oldrey (accepted)	1,561 0 0

For the erection of a detached cottage, Rusham-road, Nightingale-lane, Wandsworth-common, for Mr. James H. Bartlett. Mr. Edward Witts, architect. Quantities supplied:—

McLachlan & Sons	£1,920	0	0
Newton	1,745	0	0
Stimpson & Co.	1,728	0	0
E. & E. Smith (too late)	1,610	0	0
Bush	1,571	0	0
Gregory	1,483	0	0
Richardson	1,400	0	0
Johnson	1,382	4	11
Trigg	1,295	0	0
Holloway	1,291	0	0

For a villa residence in the Broadland's-road, Highgate, for Mr. R. M. Turnbull. Mr. J. Clark, architect. No quantities:—

Hunt, Smithfield	£3,840	0	0
Green, Clapton	2,980	0	0
King, Hornsey	2,490	0	0
Dupont, Colchester	2,255	0	0
Browne, Highgate	2,105	5	0
J. O. Richardson, Clapham*	2,050	0	0

* Accepted.

For First Portion of school buildings, Leytonstone, Essex, for the Guardians of the Poor of the Parish of Bethnal-green. Messrs. A. & C. Harston, architects. Quantities supplied:—

Crockett	£15,182	0	0
J. O. Richardson	14,587	0	0
Kilby	14,489	0	0
Johnson	13,832	0	0
Shurmur	13,425	0	0
Shaw	13,094	0	0
Jones & Co.	12,978	0	0
Julian & Co.	12,850	0	0
Braid & Co.	12,750	0	0
Garrud	12,683	0	0
Jackson & Todd (accepted)	11,570	0	0

For new road and pipe-sewers on the Hyde House estate, Edmonton:—

Wilkes & Co.	£1,118	0	0
Pizzey	895	0	0
Rutty	599	0	0

For two villa residences, Mansfield, Notts, for Mr. R. Barringer. Mr. T. Hartas, architect. Quantities by Mr. J. G. Petherick:—

Greenwood, Mansfield (accepted, subject to revision)	£1,840	0	0

For two villa residences, Nottingham, for Mr. J. Armitage. Mr. T. Hartas, architect. Quantities by Mr. J. G. Petherick:—

Bell & Son, Nottingham (accepted, subject to revision)	£1,570	0	0

For erecting new stores for the Faversham Co-operative, Industrial, and Provident Society (Limited). Mr. Edwin Pover, architect:—

		For old materials.
T. Cornelius, Whitstable	£2,485	£50
G. Johnson, Faversham	2,282	50
W. Judges, Boughton	2,203	27
L. Shrubsole, Faversham*	2,047	50

* Accepted.

For additional wing to Dr. Quin's residence, Woodville, Sheffield. Mr. J. P. Earle, architect:—

Rodley & Son, Sheffield	£205	0	0
Hirst, Bros., Norton	167	0	0
Fordham, Sheffield (accepted)	150	0	0
Willows, Sheffield	148	0	0

For enlargement and additions to a Congregational Chapel at Coves-end, Maidenhead. Mr. Arthur Vernon, architect:—

Hunt	£849	0	0
Woodbridge	795	0	0
Lovell	745	0	0

For new wing, &c., to North-town School, High Wycombe. Mr. Arthur Vernon, architect:—

Woodbridge	£750	0	0
Gibson	662	0	0
Taylor & Grist	660	0	0
Nash	635	0	0
Corby	595	10	0
Hunt	595	0	0
Loosley	579	11	6
Holland	572	0	0

For rebuilding the Rock of Gibraltar tavern, on the Lambeth Hayles estate, for Mr. J. W. Craddock (exclusive of all fittings). Quantities by Mr. Henry Smith. Messrs. Waring & Nicholson, architects:—

J. & H. Mills	£3,330	0	0
W. Shurmur	3,159	0	0
W. Downs	2,876	0	0
H. Barman	2,869	0	0
W. L. Simpson	2,785	0	0
Canning & Mullins (accepted)	2,769	0	0

For additions to the Art Schools at Kennington, for the Council of Technical Education. Quantities supplied by Mr. G. R. Tasker. Mr. Ralph Nicholson, architect:—

Peto Bros.	£1,091	0	0
Ansell	994	0	0
Bywater	987	0	0
Hobson	968	0	0
Clemence	945	0	0
Maraland (accepted)	915	0	0

For alterations and additions to St. Aloysius' Schools, Hornsey-lane, Highgate-hill. Mr. A. Vicars, architect. Quantities supplied:—

Hook & Oldrey	£4,156	0	0
Langmead & Way	3,998	0	0
Patman & Fotheringham	3,998	0	0
Staines & Son	3,944	0	0
Heath	3,860	0	0

For restoring and reseating the parish church of Broughton Astley, Leicestershire. Mr. William Bassett Smith, architect:—

J. & W. Harrold	£2,103	13	10
Fisher	1,792	14	6
Allen	1,673	0	0
Bromwich	1,585	0	0
Loveday	1,529	0	0
Edey & Wade	1,516	8	0
Young	1,475	0	0
Bland & Sons (accepted)	1,451	0	0

For alterations to the Angell-town Institution, Brixton, for Mr. W. Lemare. Mr. J. W. Stevens, architect:—
J. O. Richardson, accepted.

Army and Navy Hotel.—Mr. Pilkington says that Mr. Earle was not the surveyor for the work, although employed by the Messrs. McGregor to a certain extent.

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